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WATER-SUPPLY PAPER 312

SURFACE WATER SUPPLY OF THE UNITED STATES

1911

PART XII. NORTH PACIFIC COAST DRAINAGE BASINS

PREPARED UNDER THE DIRECTION OF M. O. LEIGHTON

BY

F. F. HENSHAW, G. C. BALDWIN, G. C. STEVENS
AND E. S. FULLER

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SURFACE WATER SUPPLY OF NORTH PACIFIC COAST DRAINAGE BASINS, 1911.

By F. F. HENSHAW, G. C. BALDWIN, G. C. STEVENS, and E. S. FULLER.

AUTHORITY FOR THE WORK.

This volume is Part XII of a series of 12 reports presenting results of measurements of flow made on certain streams in the United States during the calendar year 1911. The reports are listed in the following table:

Papers on surface water supply of the United States.

Part.[a]	No.	Title.
I	301	North Atlantic coast basins.
II	302	South Atlantic coast and eastern Gulf of Mexico basins.
III	303	Ohio River basin.
IV	304	St. Lawrence River basin.
V	305	Upper Mississippi River and Hudson Bay basins.
VI	306	Missouri River basin.
VII	307	Lower Mississippi River basin.
VIII	308	Western Gulf of Mexico basins.
IX	309	Colorado River basin.
X	310	Great Basin.
XI	311	Pacific coast basins in California.
XII	312	North Pacific coast basins.

[a] For the purpose of uniformity in the presentation of reports, a general plan has been agreed upon by the United States Reclamation Service, the United States Forest Service, the United States Weather Bureau, and the United States Geological Survey, according to which the area of the United States has been divided into 12 parts, whose boundaries coincide with natural drainage lines indicated by the parts of the report.

The data presented in these reports were collected by the United States Geological Survey under authority implied in the organic law (20 Stat. L., p. 394), which contains the following paragraph:

> *Provided*, That this officer [the Director] shall have the direction of the geological survey and the classification of public lands and examination of the geological structure, mineral resources, and products of the national domain.

The work was begun in 1888 in connection with special studies of water supply for irrigation.

Since the fiscal year ending June 30, 1895, successive sundry civil bills passed by Congress have carried the following item and appropriations:

For gaging the streams and determining the water supply of the United States and for the investigation of underground currents and artesian wells and for the preparation of reports upon the best methods of utilizing the water resources.

Annual appropriations for the fiscal year ending June 30—

1895	$12,500
1896	20,000
1897 to 1900, inclusive	50,000
1901 to 1902, inclusive	100,000
1903 to 1906, inclusive	200,000
1907	150,000
1908 to 1910, inclusive	100,000
1911 to 1914, inclusive	150,000

In the execution of the work many private and State organizations have cooperated. Acknowledgements for such cooperation are made on pages 22 and 23, and also in connection with the description of each station affected by the cooperative work.

PUBLICATIONS.

Measurements of stream flow have been made at nearly 2,000 points in the United States, and also at many points in small areas in Seward Peninsula and the Yukon-Tanana region, Alaska, and in the Hawaiian Islands. During 1911 gaging stations were maintained by the Survey and the cooperating organizations at about 1,500 points in the United States, and many discharge measurements were made at other points. In connection with this work data were also collected in regard to precipitation, evaporation, storage reservoirs, river profiles, and water power in many sections of the country, and will be made available in the regular surface water-supply papers from time to time. A complete list of the gaging stations maintained by the Survey to and including 1910, and a list of the papers relating to the water supply of the country, have been published by the Survey as Water-Supply Paper 280. An index to the reports containing stream-flow measurements prior to 1904 has been published as Water-Supply Paper 119.

For each calendar year there has been prepared a report embodying the stream-flow data collected during that year, which has been published either as a part of the Annual Report of the Director, as a bulletin, or as a water-supply paper, as shown by the following table:

Stream-flow data in reports of the United States Geological Survey.

[A=Annual Report; B=Bulletin; WS=Water-Supply Paper.]

Report.	Character of data.	Year.
10th A, pt. 2	Descriptive information only	
11th A, pt. 2	Monthly discharge	1884 to Sept., 1890.
12th A, pt. 2	do	1884 to June 30, 1891.
13th A, pt. 3	Mean discharge in second-feet	1884 to Dec. 31, 1892.
14th A, pt. 2	Monthly discharge (long-time records, 1871 to 1893)	1888 to Dec. 31, 1893.
B 131	Descriptions, measurements, gage heights, and rating	1893 and 1894.
16th A, pt. 2	Descriptive information only	
B 140	Descriptions, measurements, gage heights, ratings, and monthly discharge (also many data covering earlier years).	1895.
WS 11	Gage heights (also gage heights for earlier years)	1896.
18th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge (also similar data for some earlier years).	1895 and 1896.
WS 15	Descriptions, measurements, and gage heights, eastern United States, eastern Mississippi River, and Missouri River above junction with Kansas.	1897.
WS 16	Descriptions, measurements, and gage heights, western Mississippi River below junction of Missouri and Platte, and western United States.	1897.
19th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge (also some long-time records).	1897.
WS 27	Measurements, ratings, and gage heights, eastern United States, eastern Mississippi River, and Missouri River.	1898.
WS 28	Measurements, ratings, and gage heights, Arkansas River and western United States.	1898.
20th A, pt. 4	Monthly discharge (also for many earlier years)	1898.
WS 35 to 39	Descriptions, measurements, gage heights, and ratings	1899.
21st A, pt. 4	Monthly discharge	1899.
WS 47 to 52	Descriptions, measurements, gage heights, and ratings	1900.
22d A, pt. 4	Monthly discharge	1900.
WS 65, 66	Descriptions, measurements, gage heights, and ratings	1901.
WS 75	Monthly discharge	1901.
WS 82 to 85	Complete data	1902.
WS 97 to 100	do	1903.
WS 124 to 135	do	1904.
WS 165 to 178	do	1905.
WS 201 to 214	Complete data, except descriptions	1906.
WS 241 to 252	Complete data	1907-8.
WS 261 to 272	do	1909.
WS 281 to 292	do	1910.
WS 301 to 312	do	1911.

Note.—No data regarding stream flow are given in the 15th and 17th annual reports.

The table which follows gives, by years and drainage basins, the numbers of the papers on surface water supply published from 1899 to 1911. The data for any particular station will be found in the reports covering the years during which the station was maintained. For example, data for Machias River at Whitneyville, Me., 1903 to 1911, are published in Water-Supply Papers 97, 124, 165, 201, 241, 261, 281, and 301, which contain records for the New England streams from 1903 to 1911.

Numbers of water-supply papers containing results of stream measurements, 1899–1911.

	1899 [a]	1900 [b]	1901	1902	1903	1904	1905	1906	1907-8	1909	1910	1911
North Atlantic coast (St. John River to York River)	35	47, [c] 48	65, 75	82	97	[d] 124, [e] 125, [f] 126	[d] 165, [e] 166, [f] 167	[d] 201, [e] 202, [f] 203	241	261	281	301
South Atlantic coast and eastern Gulf of Mexico (James River to the Mississippi)	[g] 35, 36	48	65, 75	[g] 82, 83	[g] 97, 98	[f] 126, 127	[f] 167, 168	[f] 203, 204	242	262	282	302
Ohio River basin	36	48, [h] 49	65, 75	83	98	128	169	205	243	263	283	303
St. Lawrence River and Great Lakes	36	49	65, 75	[i] 82, 83	97	129	170	206	244	264	284	304
Hudson Bay and upper Mississippi River	36	49	[j] 65, 66, 75	[j] 83, 85	[j] 98, 99, [k] 100	[j] 128, 130	171	207	245	265	285	305
Missouri River	[l] 36, 37	49, [m] 50	66, 75	84	99	130, [n] 131	172	208	246	266	286	306
Lower Mississippi River	37	50	[j] 65, 66, 75	[j] 83, 84	[j] 98, 99	[j] 128, 131	[j] 169, 173	[j] 205, 209	247	267	287	307
Western Gulf of Mexico	37	50	66, 75	84	99	132	174	210	248	268	288	308
Colorado River	[o] 37, 38	50	66, 75	85	100	133	175, [p] 177	211	249	269	289	309
Great Basin	38, [q] 39	51	66, 75	85	100	133, [r] 134	176, [r] 177	212, [r] 213	250, [r] 251	270, [r] 271	290	310
Pacific coast in California	38, [s] 39	51	66, 75	85	100	134	177	213	251	271	291	311
North Pacific coast	38	51	66, 75	85	100	135	[t] 177, 178	214	252	272	292	312

[a] Rating tables and index to Water-Supply Papers 35–39 contained in Water-Supply Paper 39. Estimates for 1899 in Twenty-first Annual Report, part 4.

[b] Rating tables and index to Water-Supply Papers 47–52 and data on precipitation, wells, and irrigation in California and Utah contained in Water-Supply Paper 52. Estimates for 1900 in Twenty-second Annual Report, part 4.

[c] Wissahickon and Schuylkill rivers to James River.

[d] New England rivers only.

[e] Hudson River to Delaware River, inclusive.

[f] Susquehanna River to Yadkin River, inclusive.

[g] James River only.

[h] Scioto River.

[i] Lake Ontario and tributaries to St. Lawrence River proper.

[j] Tributaries of Mississippi from east.

[k] Hudson Bay only.

[l] Gallatin River.

[m] Loup and Platte rivers near Columbus, Nebr., and all tributaries below junction with Platte.

[n] Platte and Kansas rivers.

[o] Green and Gunnison rivers and Grand River above junction with Gunnison.

[p] Below junction with Gila.

[q] Mohave River only.

[r] Great Basin in California, except Truckee and Carson drainage basins.

[s] Kings and Kern rivers and south Pacific coast drainage basins.

[t] Rogue, Umpqua, and Siletz rivers only.

DEFINITION OF TERMS.

The volume of water flowing in a stream—the "run-off" or "discharge"—is expressed in various terms, each of which has become associated with a certain class of work. These terms may be divided into two groups—(1) those which represent a rate of flow, as second-feet, gallons per minute, miner's inches, and discharge in second-feet per square mile, and (2) those which represent the actual quantity of water, as run-off in depth in inches and acre-feet. The units used in this series of reports are second-feet, second-feet per square mile, run-off depth in inches and acre-feet. They may be defined as follows:

"Second-foot" is an abbreviation for cubic foot per second and is the unit for the rate of discharge of water flowing in a stream 1 foot wide, 1 foot deep, at a rate of 1 foot per second. It is generally used as a fundamental unit from which others are computed by the use of the factors given in the following table of equivalents.

"Second-feet per square mile" is the average number of cubic feet of water flowing per second from each square mile of area drained, on the assumption that the run-off is distributed uniformly both as regards time and area.

"Run-off (depth in inches)" is the depth to which the drainage area would be covered if all the water flowing from it in a given period were conserved and uniformly distributed on the surface. It is used for comparing run-off with rainfall, which is usually expressed in depth in inches.

An "acre-foot" is equivalent to 43,560 cubic feet and is the quantity required to cover an acre to the depth of 1 foot. The term is commonly used in connection with storage for irrigation work.

CONVENIENT EQUIVALENTS.

The following is a list of convenient equivalents for use in hydraulic computations:

Table for converting discharge in second-feet per square mile into run-off in depth in inches over the area.

Discharge in second-feet per square mile.	Run-off in inches.				
	1 day.	28 days.	29 days.	30 days.	31 days.
1	0.03719	1.041	1.079	1.116	1.153
2	.07438	2.083	2.157	2.231	2.306
3	.11157	3.124	3.236	3.347	3.459
4	.14876	4.165	4.314	4.463	4.612
5	.18595	5.207	5.393	5.578	5.764
6	.22314	6.248	6.471	6.694	6.917
7	.26033	7.289	7.550	7.810	8.070
8	.29752	8.331	8.628	8.926	9.223
9	.33471	9.372	9.707	10.041	10.376

NOTE.—For part of a month multiply the values for one day by the number of days.

Table for converting discharge in second-feet into run-off in acre-feet.

Discharge in second-feet.	Run-off in acre-feet.				
	1 day.	28 days.	29 days.	30 days.	31 days.
1	1.983	55.54	57.52	59.50	61.49
2	3.967	111.1	115.0	119.0	123.0
3	5.950	166.6	172.6	178.5	184.5
4	7.934	222.1	230.1	238.0	246.0
5	9.917	277.7	287.6	297.5	307.4
6	11.90	333.2	345.1	357.0	368.9
7	13.88	388.8	402.6	416.5	430.4
8	15.87	444.3	460.2	476.0	491.9
9	17.85	499.8	517.7	535.5	553.4

Note.—For part of a month multiply the values for one day by the number of days.

1 second-foot equals 40 California miner's inches (law of March 23, 1901).

1 second-foot equals 38.4 Colorado miner's inches.

1 second-foot equals 40 Arizona miner's inches.

1 second-foot equals 7.48 United States gallons per second; equals 448.8 gallons per minute; equals 646,317 gallons for one day.

1 second-foot for one year covers 1 square mile 1.131 feet or 13.572 inches deep.

1 second-foot for one year equals 31,536,000 cubic feet.

1 second-foot equals about 1 acre-inch per hour.

1 second-foot for one day equals 86,400 cubic feet.

1,000,000,000 (1 United States billion) cubic feet equals 11,570 second-feet for 1 day.

1,000,000,000 cubic feet equals 414 second-feet for one 28-day month.

1,000,000,000 cubic feet equals 399 second-feet for one 29-day month.

1,000,000,000 cubic feet equals 386 second-feet for one 30-day month.

1,000,000,000 cubic feet equals 373 second-feet for one 31-day month.

100 California miner's inches equals 18.7 United States gallons per second.

100 California miner's inches for one day equals 4.96 acre-feet.

100 Colorado miner's inches equals 2.60 second-feet.

100 Colorado miner's inches equals 19.5 United States gallons per second.

100 Colorado miner's inches for one day equals 5.17 acre-feet.

100 United States gallons per minute equals 0.223 second-foot.

100 United States gallons per minute for one day equals 0.442 acre-foot.

1,000,000 United States gallons per day equals 1.55 second-feet.

1,000,000 United States gallons equals 3.07 acre-feet.

1,000,000 cubic feet equals 22.95 acre-feet.

1 acre-foot equals 325,850 gallons.

1 inch deep on 1 square mile equals 2,323,200 cubic feet.

1 inch deep on 1 square mile equals 0.0737 second-foot per year.

1 foot equals 0.3048 meter.

1 mile equals 1.60935 kilometers.

1 mile equals 5,280 feet.

1 acre equals 0.4047 hectare.

1 acre equals 43,560 square feet.

1 acre equals 209 feet square, nearly.

1 square mile equals 2.59 square kilometers.

1 cubic foot equals 0.0283 cubic meter.

1 cubic foot of water weighs 62.5 pounds.

1 cubic meter per minute equals 0.5886 second-foot.

1 horsepower equals 550 foot-pounds per second.

1 horsepower equals 76.0 kilogram-meters per second.

1 horsepower equals 746 watts.

1 horsepower equals 1 second-foot falling 8.80 feet.

1⅓ horsepower equals about 1 kilowatt.

To calculate water power quickly: $\frac{\text{Sec-ft.}\times\text{fall in feet}}{11}$=net horsepower on water wheel realizing 80 per cent of theoretical power.

EXPLANATION OF DATA.

The data presented in this report cover the year beginning October 1, 1910, and ending September 30, 1911, and not, as in previous reports, the calendar year. At the 1st of January in most parts of the country a large amount of precipitation for the preceding three months is stored, either as ground water in the form of snow or in lakes. This stored water passes off in the streams during the spring break-up. At the end of September the only stored water available for run-off in the streams is possibly a small amount held in ground storage. Therefore the run-off for a year, beginning with October 1, is practically all derived from precipitation occurring within that year.

For each regular current-meter gaging station the following data, so far as available, are given: Description of the station, list of discharge measurements, table of daily gage heights, table of daily discharge, and table of monthly and yearly discharges and run-off. For stations located at weirs or dams the gage-height table is omitted.

In addition to statements regarding the location and installation of current-meter stations, the descriptions give information in regard to any conditions which may affect the constancy of the relation of gage height to discharge, covering such points as ice, logging, shifting channels, and backwater; also information regarding diversions which decrease the total flow at the measuring section. Statements are also made regarding the accuracy and reliability of the data.

The table of daily gage heights records the daily fluctuations of the surface of the river as found from the mean of the gage readings taken each day, usually in the morning and in the evening. The gage height given in the table represents the elevation of the surface of the water above the zero of the gage. All gage heights affected by the presence of ice in the streams or by backwater from obstructions are published as recorded, with suitable footnotes. The rating table is not applicable for such periods unless the proper corrections to the gage heights are known and applied. Attention is called to the fact that the zero of the gage is placed at an arbitrary datum and has no relation to zero flow or the bottom of the river. In general, the zero is located somewhat below the lowest known flow, so that negative readings shall not occur.

The discharge measurements and gage heights are the base data from which rating tables, daily discharge tables, and monthly discharge tables are computed.

The rating table gives, either directly or by interpolation, the discharge in second-feet corresponding to every stage of the river recorded during the period for which it is applicable. It is not published in this report, but can be determined from the tables of daily gage heights and daily discharge as follows:

First plot the discharge measurements for the current and earlier years on cross-section paper, with gage heights in feet as ordinates and discharge in second-feet as abscissas. Then tabulate a number of gage heights taken from the daily gage-height table for the complete range of stage given and the corresponding discharges for the days selected from the daily discharge table and plot the values on cross-section paper. The last points plotted will define the rating curve used and will lie among the plotted discharge measurements. After drawing the rating curve, a table can be developed by scaling off the discharge in second-feet for each tenth foot of gage height. These values should be so adjusted that the first differences shall always be increasing or constant, except for known backwater periods.

The table of daily discharge gives the discharge in second-feet corresponding to the observed gage heights as determined from the rating tables.

In the table of monthly discharge the column headed "Maximum" gives the mean flow, as determined from the rating table, for the day when the mean gage height was highest. As the gage height is the mean for the day, it does not indicate correctly the stage when the water surface was at crest height, and the corresponding discharge was consequently larger than given in the maximum column. Likewise, in the column of "Minimum" the quantity given is the mean flow for the day when the mean gage height was lowest. The column headed "Mean" is the average flow in cubic feet for each second during the month. On this the computations for the remaining columns, which are defined on page 17, are based.

The field methods used in the collection of the data presented in this series of reports are described in the introductory sections of Water-Supply Papers 261 to 272, inclusive, "Surface water supply of the United States, 1909." Plates I and II show the average precipitation and run-off in the United States as determined from the measurements of stream flow made by the Geological Survey and records of rainfall collected by the Weather Bureau; Plate III shows typical gaging stations; Plate IV shows current meters [1] used in the work.

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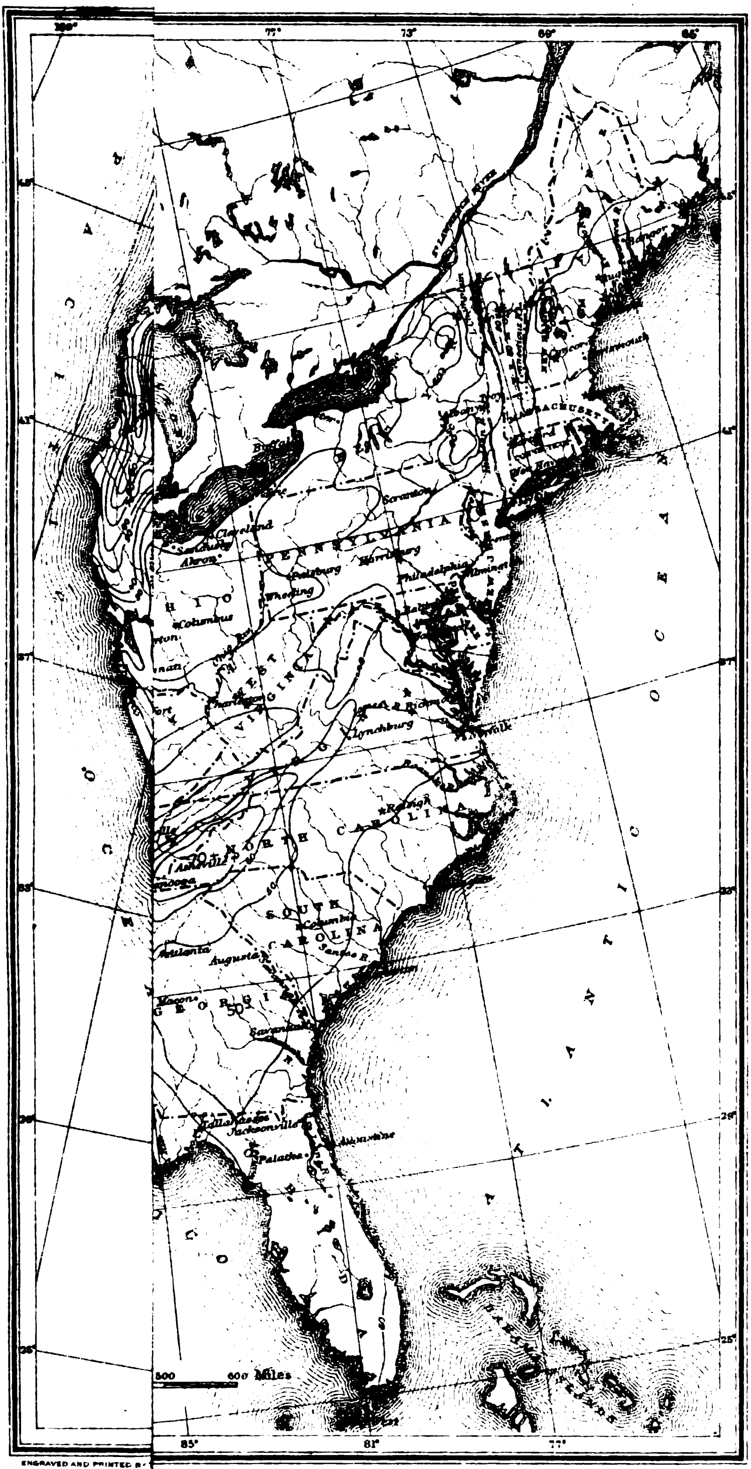
[1] See Hoyt, J. C., and others, Use and care of current meter as practiced by the United States Geological Survey: Trans. Am. Soc. Civil Eng., vol. 66, 1910, p. 70.



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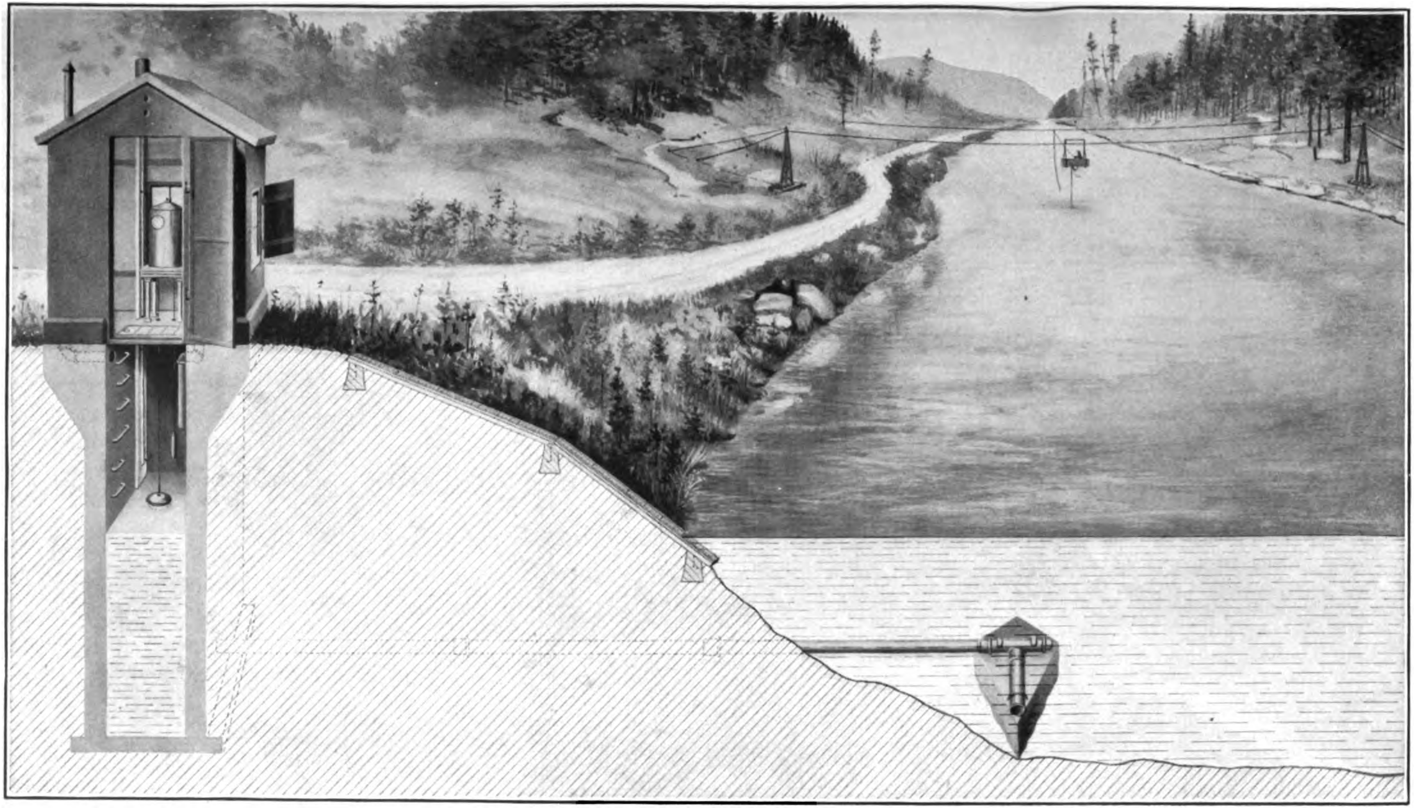
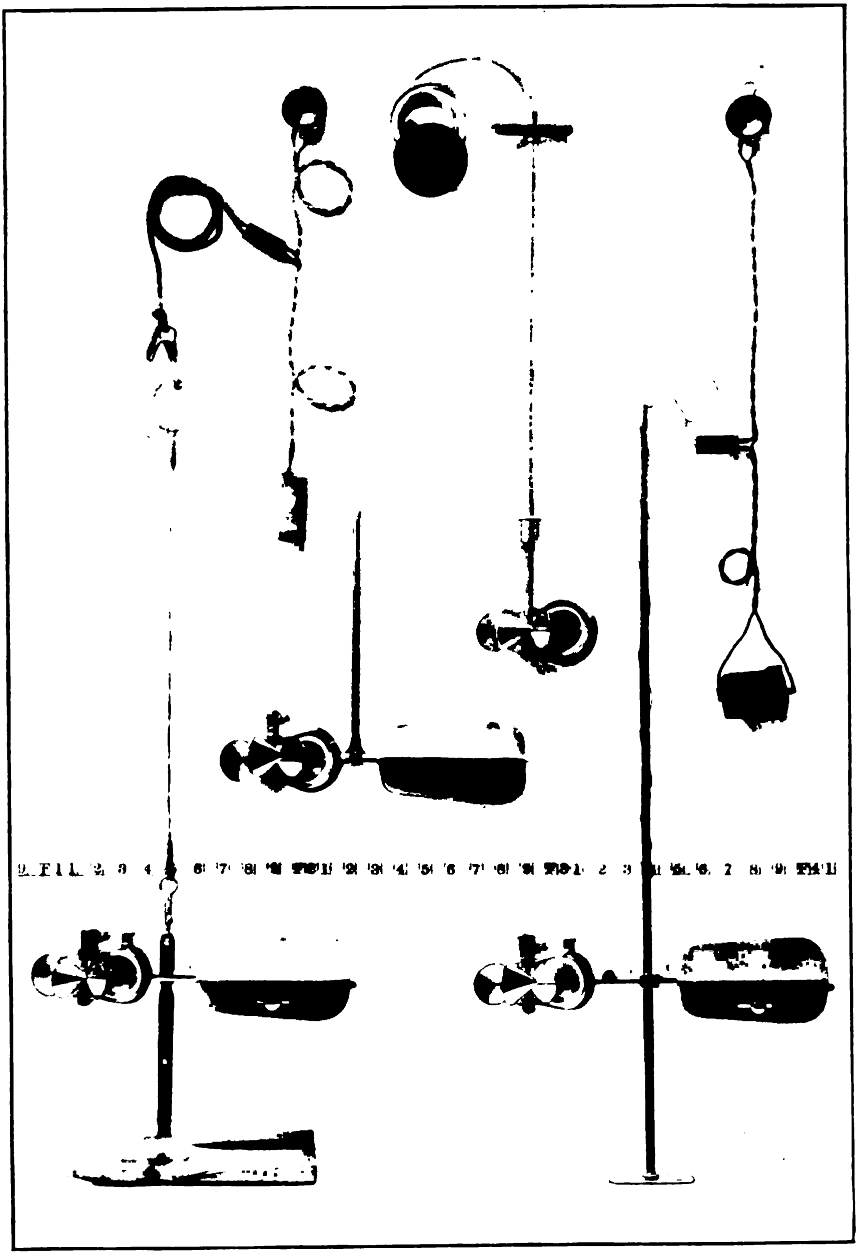
Prepared by Henry Gannett
mainly from data of the
United States Geological Survey
and United States Weather Bureau



TYPICAL GAGING STATIONS.



PRICE CURRENT METERS.

ACCURACY OF FIELD DATA AND COMPUTED RESULTS.

The accuracy of stream-flow data depends primarily on the natural conditions at the gaging station and on the methods and care with which the data are collected. Errors of the first group depend on the degree of permanency of channel and of permanency of the relation between discharge and stage.

Errors of the second class are due, first, to errors in observation of stage; second, to errors in measurements of flow; and, third, to errors due to misinterpretation of stage and flow data.

In order to give engineers and others information regarding the probable accuracy of the computed results, footnotes are added to the daily discharge tables, stating the probable accuracy of the rating tables used, and an accuracy column is inserted in the monthly discharge table. For the rating tables "well defined" indicates, in general, that the rating is probably accurate within 5 per cent; "fairly well defined," within 10 per cent; "poorly defined" or "approximate," within 15 to 25 per cent. These notes are very general and are based on the plotting of the individual measurements with reference to the mean rating curve.

The accuracy column in the monthly discharge table does not apply to the maximum or minimum nor to any individual day, but to the monthly mean. It is based on the accuracy of the rating, the probable reliability of the observer, and knowledge of local conditions. In this column A indicates that the mean monthly flow is probably accurate within 5 per cent; B, within 10 per cent; C, within 15 per cent; D, within 25 per cent. Special conditions are covered by footnotes.

Even though the monthly means for any station may represent with a high degree of accuracy the quantity of water flowing past the gage, the figures showing discharge per square mile and depth of run-off in inches may be subject to gross errors which result from including in the measured drainage area large noncontributing districts or omitting estimates of water diverted for irrigation or other use, and they should therefore be considered as only approximate, particularly for periods of irrigation or of low water. For these errors it is as a rule not feasible to make adequate correction.

In general the base data collected each year by the Survey engineers are published not only to comply with the law but to afford any engineer the means of examining and adjusting to his own needs the results of the computations. The table of monthly discharge is so arranged as to give only a general idea of the flow at the station and should not be used for other than preliminary estimates. The determinations of daily discharge allow more detailed studies of the variation in flow by which the period of deficiency may be determined.

It should be borne in mind that the observations in each succeeding year may be expected to throw new light on data already collected and published, and the engineer who makes use of the figures presented in these papers should verify all ratings and make such adjustments for earlier years as may seem necessary.

COOPERATION AND ASSISTANCE.

CONDITIONS OF COOPERATIVE WORK.

During the year ending September 30, 1911, the work in Oregon, Washington, Idaho, and Montana has been done under cooperative agreements between the United States Geological Survey and the respective States.

In this work the State is the chief beneficiary, for its interest in obtaining a thorough and reliable knowledge of its water resources is paramount. At a very moderate cost for field work the State procures the services of men already trained in collecting and analyzing the fundamental data, and after the material has been gathered it is published without additional expense on the part of the State.

In general the cooperative agreements specify that the United States Geological Survey shall allot from its appropriation a sum equal to that appropriated from State funds; but to obtain results at all commensurate with public needs it has been necessary to expend a much larger sum.

The United States Reclamation Service, which is a heavy investor in the development of the water resources of the Western States, has been so handicapped by a lack of physical data that it has been forced to expend from its own fund considerable money for investigations of this kind. The United States Indian Office also, in the development of projects for the benefit of the Indians, has found it necessary to make certain investigations of water supply. As these investigations are closely allied with the collection of statistics of rain and snowfall, the cooperation of the United States Weather Bureau has been enlisted to a small extent. The engineers of the Geological Survey in their regular field work are able to install and inspect some of the rainfall stations maintained by the Weather Bureau with but little loss of time. Under agreements with the Reclamation Service and with the Office of Indian Affairs the work has been performed under the direction of the engineers of the Geological Survey. Careful cost accounts have been kept of this work and repayments made to the Geological Survey of the amounts represented.

In order to determine the run-off from drainage areas in western forest reserves, cooperation has been entered into between the United States Geological Survey and the Forest Service. The gages are read, as a rule, by forest rangers or persons in the immediate vicinity of the stations if possible. Discharge measurements are made by engineers appointed and paid by the Forest Service. These engineers are instructed and their work is supervised by engineers of the United States Geological Survey. The final records are studied, ratings are made, and the results are published by the Geological Survey.

Cooperation with the States is effected under contracts which are made between the Director of the Federal Survey and the State engineers or other officials and are authorized by legislative acts appropriating moneys. The State contracts are essentially of the same order, the principal provisions being substantially as follows:

1. The United States Geological Survey retains direct supervision of the field work and the preparation of the data for publication.
2. The Federal Survey retains possession of all material collected—field notes, maps, etc.—but this material is open at all times to inspection by the State officials, and if not satisfactory the agreements can be terminated at any time.
3. The salaries of gage observers and the salaries and traveling and field expenses of the engineers are divided between the two parties in some manner agreed upon, the accounts being rendered monthly in accordance with the regulations of the Federal Survey.
4. The streams and localities in which investigations shall be made are determined by conference between the State officials and the representatives of the United States Geological Survey.
5. The cost of publication is borne entirely by the Federal Survey.

SPECIAL ACKNOWLEDGMENTS.

Special acknowledgments are due to John H. Lewis, State engineer of Oregon; to Henry Landes, State geologist of Washington; to D. G. Martin, who was State engineer of Idaho until March, 1911, and to his successor in office, A. E. Robinson, for the very efficient manner in which they represented their respective States in the cooperative investigations.

Acknowledgments are due to the engineers and employees of the United States Reclamation Service, the United States Forest Service, and of the United States Office of Indian Affairs for assistance, suggestions, and the freest use of data gathered exclusively for them and for which they have paid. Acknowledgments are also due to the Corps of Engineers, United States Army, and the officers of the United States Weather Bureau for hydrographic and climatologic data. A number of irrigation and power companies, several railroad companies, and many individuals have cooperated in the maintenance of many stations and have cheerfully furnished much valuable information; for assistance and suggestions thus rendered acknowledgment is hereby made.

DIVISION OF WORK.

The field data in the Columbia River basin in Oregon and Washington, the Puget Sound drainage area, and the Pacific Ocean drainage area in Oregon were collected by F. F. Henshaw, district engineer, assisted by G. L. Parker, E. S. Fuller, Howard Kimble, F. C. Ebert, F. B. Storey, R. W. Davenport, John Dubuis, Charles Leidl, W. O. Harmon, and R. K. Ray, and by B. F. Heintzelman, H. P. Gilkey, R. C. Pierce, W. W. Clifford, Forest Service hydrographers.

The ratings, special estimates, analyses, computations, and final preparation of the completed data of Oregon and Washington for publication were made under the direction of F. F. Henshaw, district engineer, by E. S. Fuller, office engineer, assisted by G. L. Parker, Howard Kimble, F. B. Storey, R. W. Davenport, F. C. Ebert, B. F. Heintzelman, H. P. Gilkey, R. C. Pierce, and W. W. Clifford, and by G. C. Stevens, assistant engineer, assisted by H. D. Padgett, J. G. Mathers, H. J. Dean, A. H. Tuttle, M. I. Walters, C. L. Batchelder, J. J. Phelan, M. E. McChristie, A. W. Harrington, G. A. Wallace, and C. F. Walker.

The field data for the Snake River drainage area in Idaho have been collected by E. C. LaRue, district engineer, G. C. Baldwin, O. W. Hartwell, A. B. Purton, Lynn Crandall, G. H. Canfield, J. C. Dort, and H. L. Stoner. The ratings, special estimates, and analyses of computed data were made by G. C. Baldwin, O. W. Hartwell, A. B. Purton, G. C. Stevens, R. C. Rice, and H. D. Padgett. The computations and preparation of completed data for publication were made under the direction of R. H. Bolster, hydraulic engineer, by G. C. Stevens, H. D. Padgett, J. G. Mathers, R. C. Rice, H. J. Dean, A. H. Tuttle, M. I. Walters, C. L. Batchelder, J. J. Phelan. M. E. McChristie, A. W. Harrington, G. A. Wallace, and C. F. Walker.

The field data for the Clark Fork drainage area in Montana have been collected by W. A. Lamb, district engineer, assisted by Raymond Richards, B. E. Jones, and J. C. Beebe, and by C. S. Heidel, State hydrographer. The ratings, special estimates, and analyses of completed data were made by W. A. Lamb, and Raymond Richards. The computations and the preparation of completed data for publication were made under the direction of G. C. Stevens and Raymond Richards, assistant engineers, by H. D. Padgett, J. G. Mathers, R. C. Rice, H. J. Dean, A. H. Tuttle, M. I. Walters, C. L. Batchelder, J. J. Phelan, M. E. McChristie, A. W. Harrington, G. A. Wallace, and C. F. Walker.

The manuscript has been edited by Mrs. B. D. Wood.

GAGING STATION RECORDS.

ROGUE RIVER BASIN.

ROGUE RIVER NEAR TRAIL, OREG.

Location.—In the SW. ¼ sec. 10, T. 34 S., R. 1 W., 3 miles below Elk Creek, about 12 miles above Little Butte Creek, and 1½ miles below Trail post office.

Records available.—December 3, 1910, to March 30, 1911; August 5 to September 30, 1911.

Drainage area.—Not measured.

Gages.—Vertical staff installed August 5, 1911; the gage (vertical staff) used from December 3, 1910, to March 30, 1911, was located in sec. 3, T. 34 S., R. 1 W., just above Trail Creek, at Trail.

Channel.—Gravel; probably shifting in extreme floods.

Discharge measurements.—Made from ferry at lower gage.

Estimates withheld for additional data.

Discharge measurements of Rogue River near Trail, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.		Discharge.
		Old gage.	New gage.	
1910.		*Feet.*	*Feet.*	*Sec.-ft.*
Aug. 24	Ebert and Heintzleman	[a] 1.01	....	1,210
1911.				
Aug. 5	Heintzleman and Pierce	1.02	1.64	1,450

[a] Published incorrectly in Water-Supply Paper 292.

Daily gage height, in feet, of Rogue River near Trail, Oreg., for the year ending Sept. 30, 1911.

[Chas. Blaess, observer.]

Day.	Dec.	Jan.	Feb.	Mar.	Aug.	Sept.	Day.	Dec.	Jan.	Feb.	Mar.	Aug.	Sept.
1	......	1.5	2.2	1.4	......	1.6	16	2.7	1.4	1.8	1.2	1.6	1.6
2	......	1.4	2.1	1.3	......	1.6	17	2.4	1.6	1.7	1.2	1.6	1.6
3	......	1.4	2.1	1.3	......	1.6	18	2.1	1.7	1.6	1.3	1.6	1.6
4	2.0	1.4	2.1	1.2	......	1.6	19	2.1	6.9	1.5	1.3	1.6	1.6
5	2.3	1.4	2.0	1.2	......	1.6	20	2.0	6.0	1.5	1.3	1.6	1.6
6	2.5	1.3	2.0	1.2	1.6	1.7	21	1.9	5.3	1.4	1.2	1.6	1.6
7	2.7	1.3	1.9	1.1	1.6	1.7	22	1.9	5.0	1.3	1.2	1.6	1.6
8	3.0	1.3	1.9	1.1	1.6	1.6	23	1.9	4.5	1.3	1.2	1.6	1.6
9	3.5	1.3	1.9	1.0	1.6	1.6	24	1.9	3.0	1.2	1.1	1.6	1.6
10	3.7	1.2	2.0	1.0	1.6	1.6	25	1.8	2.5	1.2	1.1	1.6	1.6
11	3.5	1.2	2.4	1.1	1.6	1.6	26	1.8	2.0	1.1	1.1	1.6	1.7
12	3.0	1.2	2.4	1.2	1.6	1.6	27	1.7	2.0	1.1	1.2	1.6	1.7
13	2.9	1.3	2.3	1.3	1.6	1.7	28	1.6	2.1	1.1	1.3	1.6	1.7
14	2.8	1.3	2.1	1.3	1.6	1.7	29	1.6	2.2	......	1.4	1.6	1.6
15	2.8	1.4	2.0	1.2	1.6	1.6	30	1.6	2.4	......	1.5	1.6	1.6
							31	1.5	2.4	......	1.5	1.6	......

ROGUE RIVER NEAR TOLO, OREG.

Location.—In sec. 18, T. 36 S., R. 2 W., at Gold Ray, just below the dam and power house of the Rogue River Electric Co., 7 miles above Gold Hill, 9 miles below Medford, 1¼ miles below Tolo, and about one-half mile below the mouth of Bear Creek.

Records available.—August 30, 1905, to September 30, 1911.

Drainage area.—2,020 square miles.

Gage.—Vertical staff bolted to concrete pier of bridge.

Channel.—Rock and bowlders; practically permanent. One channel at all stages.

Discharge measurements.—Made from cable 300 feet below gage.

Accuracy.—Gage heights subject to fluctuation caused by operation of power plant. Rating curve good. General accuracy good.

Cooperation.—Gage-height record furnished by Rogue River Electric Co.

Discharge measurements of Rogue River near Tolo, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*
Dec. 1	B. F. Heintzleman	3.80	5,410
1911.			
Feb. 6	.....do	3.10	4,170
Apr. 12	.....do	2.70	3,040
July 31	Heintzleman and Pierce	1.04	1,370

Daily gage height, in feet, of Rogue River near Tolo, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.8	0.8	3.95	2.0	4.6	2.0	3.8	2.7	3.2	1.9	1.2	0.9
2	.8	.7	3.35	2.0	5.0	2.0	3.9	2.7	3.2	1.9	1.2	.9
3	.8	.7	7.85	2.0	4.4	1.9	3.6	2.7	3.0	1.8	1.2	.9
4	1.0	.7	6.2	1.9	3.4	2.1	3.2	2.7	3.0	1.8	1.1	.9
5	1.0	.7	4.6	1.9	3.2	2.2	3.3	2.8	2.8	1.8	1.1	.9
6	1.0	.7	4.05	1.9	3.2	2.4	3.2	2.9	2.8	1.8	1.1	.9
7	.95	.75	3.4	1.9	2.9	2.5	3.0	2.8	2.8	1.8	1.1	.9
8	.9	2.05	3.7	1.9	2.7	2.8	3.0	2.8	2.8	1.7	1.1	.9
9	.9	2.4	4.9	2.0	2.6	2.7	3.0	2.7	2.7	1.7	1.0	.9
10	.9	1.8	4.4	2.2	2.7	2.6	3.0	2.6	2.7	1.7	1.0	.9
11	.9	1.85	4.35	2.2	3.4	2.4	3.0	2.5	2.7	1.7	1.0	.9
12	1.1	1.65	3.95	2.2	2.9	2.3	2.8	2.5	2.8	1.6	1.0	.9
13	1.2	1.6	3.3	2.0	3.0	2.4	2.8	2.6	2.8	1.6	1.0	.9
14	1.1	1.6	3.1	1.9	2.9	2.4	2.8	2.6	2.8	1.6	1.0	.9
15	1.05	1.6	2.8	1.8	2.6	2.6	2.6	2.6	2.8	1.6	1.0	.9
16	1.0	1.6	2.8	2.0	2.4	2.7	2.6	2.6	2.6	1.5	1.0	.9
17	1.0	1.6	3.0	2.2	2.4	2.9	2.6	2.6	2.6	1.5	1.0	.9
18	1.0	1.85	2.9	3.1	2.6	3.0	2.6	3.2	2.6	1.5	1.0	.9
19	.9	1.9	2.8	8.8	2.4	3.0	2.6	3.6	2.4	1.4	1.0	.9
20	.9	1.7	2.75	6.2	2.3	3.2	2.5	3.2	2.2	1.4	1.0	.9
21	.9	1.8	2.5	4.2	2.3	3.2	2.5	3.2	2.0	1.4	1.0	.9
22	.9	2.65	2.5	3.2	2.2	3.4	2.6	3.2	2.0	1.4	1.0	.9
23	.8	5.45	2.35	3.0	2.1	3.6	2.7	3.2	2.0	1.4	1.0	.8
24	.8	4.35	2.55	3.0	2.1	3.7	2.7	3.2	2.0	1.4	.9	.8
25	.8	3.45	2.3	3.1	2.1	3.4	3.1	3.0	2.0	1.4	.9	.8
26	.8	2.55	2.2	3.0	2.1	3.2	3.2	3.0	1.9	1.4	.9	.8
27	.8	3.55	2.15	3.0	2.0	3.1	3.0	2.9	1.9	1.4	.9	.9
28	.8	12.05	2.1	3.1	2.0	3.0	2.8	2.8	1.9	1.4	.9	.9
29	.8	8.15	2.0	3.0	....	3.0	2.8	2.8	1.9	1.4	.9	.8
30	.8	4.8	2.0	3.2	....	3.2	2.7	2.8	1.9	1.3	.9	.8
31	.8	....	2.0	4.2	....	3.1	....	2.7	....	1.2	.9	....

Daily discharge, in second-feet, of Rogue River near Tolo, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1,180	1,180	5,940	2,440	7,490	2,440	5,600	3,510	4,370	2,300	1,510	1,250
2	1,180	1,120	4,660	2,440	8,540	2,440	5,820	3,510	4,370	2,300	1,510	1,250
3	1,180	1,120	16,800	2,440	6,990	2,300	5,160	3,510	4,000	2,170	1,510	1,250
4	1,330	1,120	11,900	2,300	4,750	2,580	4,370	3,510	4,000	2,170	1,420	1,250
5	1,330	1,120	7,490	2,300	4,370	2,730	4,560	3,670	3,670	2,170	1,420	1,250
6	1,330	1,120	6,160	2,300	4,370	3,030	4,370	3,830	3,670	2,170	1,420	1,250
7	1,290	1,150	4,750	2,300	3,830	3,190	4,000	3,670	3,670	2,170	1,420	1,250
8	1,250	2,510	5,380	2,300	3,510	3,670	4,000	3,670	3,670	2,040	1,420	1,250
9	1,250	3,030	8,270	2,440	3,350	3,510	4,000	3,510	3,510	2,040	1,330	1,250
10	1,250	2,170	6,990	2,730	3,510	3,350	4,000	3,350	3,510	2,040	1,330	1,250
11	1,250	2,240	6,870	2,730	4,750	3,030	4,000	3,190	3,510	2,040	1,330	1,250
12	1,420	1,980	5,940	2,730	3,830	2,880	3,670	3,190	3,670	1,920	1,330	1,250
13	1,510	1,920	4,560	2,440	4,000	3,030	3,670	3,350	3,670	1,920	1,330	1,250
14	1,420	1,920	4,180	2,300	3,830	3,030	3,670	3,350	3,670	1,920	1,330	1,250
15	1,380	1,920	3,670	2,170	3,350	3,350	3,350	3,350	3,670	1,920	1.330	1,250
16	1,330	1,920	3,670	2,440	3,030	3,510	3,350	3,350	3,350	1,810	1,330	1,250
17	1,330	1,920	4,000	2,730	3,030	3,830	3,350	3,350	3,350	1,810	1,330	1,250
18	1,330	2,240	3,830	4,180	3,350	4,000	3,350	4,370	3,350	1,810	1,330	1,250
19	1,250	2,300	3,670	19,800	3,030	4,000	3,350	5,160	3,030	1,700	1,330	1,250
20	1,250	2,040	3,590	11,900	2,880	4,370	3,190	4,370	2,730	1,700	1,330	1,250
21	1,250	2,170	3,190	6,510	2,880	4,370	3,190	4,370	2,440	1,700	1,330	1,250
22	1,250	3,430	3,190	4,370	2,730	4,750	3,350	4,370	2,440	1,700	1,330	1,250
23	1,180	9,760	2,960	4,000	2,580	5,160	3,510	4,370	2,440	1,700	1,330	1,180
24	1,180	6,870	3,270	4,000	2,580	5,380	3,510	4,370	2,440	1,700	1,250	1,180
25	1,180	4,850	2,880	4,180	2,580	4,750	4,180	4,000	2,440	1,700	1,250	1,180
26	1,180	3,270	2,730	4,000	2,580	4,370	4,370	4,000	2,300	1,700	1,250	1,180
27	1,180	5,060	2,660	4,000	2,440	4,180	4,000	3,830	2,300	1,700	1,250	1,250
28	1,180	31,000	2,580	4,180	2,440	4,000	3,670	3,670	2,300	1,700	1,250	1,250
29	1,180	17,700	2,440	4,000	....	4,000	3,670	3,670	2,300	1,700	1,250	1,180
30	1,180	8,010	2,440	4,370	....	4,370	3,510	3,670	2,300	1,600	1,250	1,180
31	1,180	....	2,440	6,510	....	4,180	....	3,510	....	1,510	1,250	....

NOTE.—Discharge determined from a rating curve fairly well defined between 1,250 and 6,000 second-feet.

Monthly discharge of Rogue River near Tolo, Oreg., for the year ending Sept. 30, 1911.

[Drainage area, 2,020 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	1,510	1,180	1,260	0.624	0.72	77,500	C.
November	31,000	1,120	4,270	2.11	2.35	254,000	C.
December	16,800	2,440	4,940	2.45	2.82	304,000	B.
January	19,800	2,170	4,110	2.03	2.34	253,000	B.
February	8.540	2,440	3,810	1.89	1.97	212,000	B.
March	5,380	2,300	3,670	1.82	2.10	226,000	B.
April	5,820	3,190	3,930	1.95	2.18	234,000	B.
May	5,160	3,190	3,760	1.86	2.14	231,000	B.
June	4,370	2,300	3,200	1.58	1.76	190,000	B.
July	2,300	1,510	1,890	.936	1.08	116,000	B.
August	1,510	1,250	1,340	.663	.76	82,400	C.
September	1,250	1,180	1,240	.614	.68	73,800	C.
The year	31,000	1,120	3,110	1.54	20.90	2,250,000	

MILL CREEK AT PROSPECT, OREG.

Location.—In sec. 29, T. 32 S., R. 3 E., 100 feet above the Mill Creek bridge in Prospect.

Records available.—August 23, 1910, to October 20, 1911, fragmentary.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Gravel and bowlders; obstructed by fallen logs.

Discharge measurements.—Made by wading near the gage.

Cooperation.—Gage heights and part of the measurements furnished by United States Forest Service.

Estimates withheld for additional data.

The following discharge measurement was made by Heintzleman and Pierce: August 3, 1911: Gage height, 2.04 feet; discharge, 51.8 second-feet.

Daily gage height, in feet, of Mill Creek at Prospect, Oreg., for the period Aug. 3, 1911, to Oct. 20, 1911.

[Mrs. G. H. West, observer.]

Day.	Aug.	Sept.	Oct.	Day.	Aug.	Sept.	Oct.	Day.	Aug.	Sept.	Oct.
1		2.0	2.1	11	2.0	2.0	2.0	21	2.0		
2		2.0		12	2.0	2.0	2.0	22	2.0		
3	2.0	2.0		13	2.0	2.0		23	2.0	2.0	
4	2.0			14	2.0	2.0	2.0	24	2.0		
5	2.0	2.0		15	2.0	2.0		25	2.0		
6	2.0	2.0		16	2.0	2.0		26	2.0	2.1	
7	2.0	2.0		17	2.0	2.0		27	2.0		
8	2.0	2.0		18	2.0		2.0	28	2.0		
9	2.0	2.0		19	2.0		2.0	29	2.0	2.1	
10	2.0	2.0	2.0	20	2.0		2.0	30	2.0	2.0	
								31	2.0		

SOUTH FORK OF BIG BUTTE CREEK AT BUTTE FALLS, OREG.

Location.—In the SE. ¼ sec. 11, T. 35 S., R. 2 E., at the county bridge about 1 mile above Butte Falls and 2 miles above the mouth of the creek.

Records available.—September 20, 1910, to October 5, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Rocks and gravel; shifting.

Discharge measurements.—Made by wading or from the highway bridge.

Accuracy.—Somewhat impaired by the shifting of the channel and the infrequency of the discharge measurements.

Discharge measurements of South Fork of Big Butte Creek at Butte Falls, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
1910 Nov. 24	B. F. Heintzleman	1.88	344
1911 Feb. 8	B. F. Heintzleman	1.77	307
Apr. 9	do	1.98	309
Sept. 8	R. C. Pierce	1.43	118

Daily gage height, in feet, of South Fork of Big Butte Creek at Butte Falls, Oreg., for the period Sept. 20, 1910, to Oct. 5, 1911.

[Amos Boughton, observer.]

Day.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1		1.4	1.4			2.0	1.7	2.0	1.8		1.5		1.4	
2		1.4	1.4	1.9	1.6					1.7		1.4	1.4	1.4
3		1.4	1.4	2.2		2.0	1.7	2.0	1.8	1.7	1.5		1.4	
4		1.4			1.6	1.9	1.7					1.4	1.4	
5		1.4		2.0				2.2	1.9	1.6	1.5	1.5		1.4
6		1.4	1.4		1.6	1.9	1.8				1.5		1.4	
7		1.4	1.4	1.8	1.6			2.0		1.5		1.4		
8		1.4	1.8			2.0	2.0	2.0	1.7	1.6	1.5			
9		1.4	1.5	2.0	1.7								1.4	
10				2.1		1.8	2.0	2.1	1.7	1.6	1.5	1.4	1.4	
11					1.6	1.8	2.0		1.7					
12		1.5	1.5					2.0		1.5	1.4	1.4	1.4	
13		1.4	1.4	1.9	1.6	1.8	2.1		1.7		1.4			
14		1.4	1.4		1.6			1.9		1.5		1.4	1.4	
15				1.8		1.8	2.1	1.9	1.6		1.4			
16		1.4		1.9	1.6					1.5		1.4	1.4	
17			1.4	1.9		1.9	2.2	1.9	1.8	1.5	1.4		1.4	
18		1.4	1.6		1.7	1.8	2.2					1.4		
19		1.4	1.5	1.9				1.9	1.9	1.5	1.4	1.4	1.4	
20	1.4	1.4	1.5	1.7	2.4	1.8	2.3		1.9					
21	1.4	1.4	1.5	1.7	2.3			1.9		1.5	1.4	1.4	1.4	
22	1.4	1.4	1.6	1.7		1.7	2.3	1.8	1.8		1.4			
23	1.4	1.4	2.2	1.6	2.0					1.5		1.4	1.4	
24	1.4	1.4	1.9	1.8			2.3	1.9	1.8	1.5	1.4			
25	1.4	1.4		1.7	1.9	1.7	2.3					1.4	1.4	
26	1.4	1.4	1.6					1.9	1.8		1.4	1.4		
27	1.4			1.7	1.9	1.7	2.1		1.8	1.6			1.4	
28	1.4		3.2		1.9			1.9			1.4	1.4		
29		1.4		1.7			2.0	1.8	1.7	1.5	1.4		1.4	
30	1.4	1.4	2.2		1.9								1.4	
31		1.4		1.8			2.0		1.7		1.4			

NOTE.—Gage heights for December, 1910, have been corrected for error in gage, and do not agree with those published in Water-Supply Paper 292.

Daily discharge, in second-feet, of South Fork of Big Butte Creek at Butte Falls, Oreg., for the period Sept. 20, 1910, to Oct. 5, 1911.

Day.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1		120	120	458	266	420	264	320	233	195	130	102	102	102
2		120	120	362	222	420	264	320	233	195	130	102	102	102
3		120	120	554	222	420	264	320	233	195	130	102	102	102
4		120	120	487	222	362	264	375	254	178	130	102	102	102
5		120	120	420	222	362	287	430	275	161	130	130	102	102
6		120	120	365	222	362	310	375	248	146	130	116	102	
7		120	120	310	222	391	365	320	222	130	130	102	102	
8		120	262	365	243	420	420	320	195	161	130	102	102	
9		120	152	420	264	365	420	345	195	161	130	102	102	
10		131	152	484	243	310	420	370	195	161	130	102	102	
11		141	152	443	222	310	420	345	195	146	116	102	102	
12		152	152	403	222	310	452	320	195	130	102	102	102	
13		120	120	362	222	310	484	298	195	130	102	102	102	
14		120	120	336	222	310	484	275	178	130	102	102	102	
15		120	120	310	222	310	484	275	161	130	102	102	102	
16		120	120	362	222	336	519	275	197	130	102	102	102	
17		120	120	362	243	362	554	275	233	130	102	102	102	
18		120	185	362	264	310	554	275	254	130	102	102	102	
19		120	152	362	488	310	592	275	275	130	102	102	102	
20	120	120	152	264	712	310	630	275	275	130	102	102	102	
21	120	120	152	264	630	287	630	275	254	130	102	102	102	
22	120	120	185	264	525	264	630	233	233	130	102	102	102	
23	120	120	554	222	420	264	630	254	233	130	102	102	102	
24	120	120	362	310	391	264	630	275	233	130	102	102	102	
25	120	120	292	264	362	264	630	275	233	140	102	102	102	
26	120	120	222	264	362	264	500	275	233	150	102	102	102	
27	120	120	871	264	362	264	370	275	233	161	102	102	102	
28	120	120	1,520	264	362	264	345	275	214	146	102	102	102	
29	120	120	1,040	264	362		320	233	195	130	102	102	102	
30	120	120	554	287	362		320	233	195	130	102	102	102	
31		120		310	391		320		195		102	102		

NOTE.—Discharge determined from three poorly defined rating curves.

Monthly discharge of South Fork of Butte Creek at Butte Falls, Oreg, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	152	120	122	7,500	B.
November	1,520	120	285	17,000	B.
December	554	222	347	21,300	B.
January	712	222	320	19,700	B.
February	420	264	327	18,200	B.
March	630	264	444	27,300	B.
April	430	233	300	17,900	B.
May	275	161	222	13,600	B.
June	195	130	146	8,690	B.
July	130	102	111	6,820	B.
August	130	102	103	6,330	B.
September	102	102	102	6,070	B.
The year	1,520	102	235	170,000	

SOUTH FORK OF LITTLE BUTTE CREEK NEAR LAKECREEK, OREG.

Location.—In sec. 11, T. 37 S., R. 2 E., at the county bridge 5 miles above Lakecreek post office and the junction of North and South Forks of Little Butte Creek.

Records available.—November 26, 1910, to Sept. 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on bridge pier.

Channel.—Sand and bowlders; shifting.

Discharge measurements.—Made from highway bridge or by wading.

Accuracy.—Results fair.

Cooperation.—Maintained in cooperation with Rogue River Valley Canal Co.

Discharge measurements of South Fork of Little Butte Creek near Lakecreek, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*
Nov. 26	B. F. Heintzleman	1.18	46.5
1911.			
Feb. 5	B. F. Heintzleman	1.38	87.0
Apr. 7	.....do	1.83	218
June 4	.....do	1.62	163

Daily gage height, in feet, of South Fork of Little Butte Creek near Lakecreek, Oreg., for the year ending Sept. 30, 1911.

[W. T. Kinney, observer.]

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1		2.20	1.20	1.57	1.40	2.05	1.57		0.90	0.70	0.70
2		2.30		1.47		2.10	1.67	1.67		.70	.80
3		2.40	1.20		1.40		1.67	1.67	.90	.80	
4		2.20	1.20	1.47	1.30	1.97	1.67	1.57	.80		.80
5		2.00	1.30		1.40		1.67			.80	.80
6		1.80	1.30	1.57	1.47	1.87	1.57	1.57	.80	.80	.80
7		1.60	1.30	1.47	1.67	1.82		1.40		.70	.80
8		1.20		1.50	1.57	1.87	1.47	1.47	.80		
9		1.00	1.20	1.50				1.47	.70	.70	.80
10		1.00	1.30	1.40		1.67	1.50	1.40			.80
11		1.00	1.40		1.50		1.40	1.40	.80	.80	.70
12		1.00		1.40		1.57			.70	.80	
13		1.50	1.40	1.30	1.50	1.57	1.30	1.30			.70
14		1.30	1.50	1.40		1.47			.70	.80	.70
15		1.00	1.40	1.50	1.40		1.30	1.30	.80	.70	
16		1.00	1.30	1.47	1.50	1.50	1.30	1.20	.80		.80
17		1.30	1.40	1.50		1.50	1.20		.80	.80	.80
18		1.50	1.40		1.47	1.47				.70	.70
19		1.80	1.50	1.40			1.30		.90		
20		1.70	1.67			1.47	1.20	1.10		.70	.80
21		1.30	2.05	1.40	1.57				.80	.70	.80
22		1.20	2.15	1.30		1.57	1.40	1.10	.70		
23			1.87		1.67		1.30	1.20	.80	.70	.80
24		1.00	1.67	1.40	1.47	1.67	1.30	1.20	.80		.90
25		1.10	1.57				1.30			.70	.90
26	1.20	1.20	1.47	1.40	1.77	1.57		1.20	.80		
27	1.30	1.10	1.50			1.57	1.40	1.40	.70	.80	.90
28	2.10	1.00	1.57	1.50	1.67		1.50	1.30	.70	.80	.80
29	2.00	1.00	1.67		1.67	1.47	1.47	1.20	.70		.80
30	2.00	1.10	1.77		1.77	1.57		1.10	.70	.70	.80
31		1.20	1.57		1.87		1.47		.70	.70	

Daily discharge, in second-feet, of South Fork of Little Butte Creek near Lakecreek, Oreg., for the year ending Sept. 30, 1911.

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1		390	50	141	92	318	141	142	20	9	9
2		440	50	112	92	340	171	171	20	9	14
3		490	50	112	92	312	171	171	20	14	14
4		390	50	112	68	283	171	141	14	14	14
5		295	68	126	92	263	171	141	14	14	14
6		215	68	141	112	243	141	141	14	14	14
7		150	68	112	171	223	126	92	14	9	14
8		50	59	120	141	243	112	112	14	9	14
9		27	50	120	134	207	116	112	9	9	14
10		27	68	92	127	171	120	92	12	12	14
11		27	92	92	120	156	92	92	14	14	9
12		27	92	92	120	141	80	80	9	14	9
13		120	92	68	120	141	68	68	9	14	9
14		68	120	92	106	112	68	68	9	14	9
15		27	92	120	92	116	68	68	14	9	12
16		27	68	112	120	120	68	50	14	12	14
17		68	92	120	116	120	50	47	14	14	14
18		120	92	106	112	112	59	43	17	9	9
19		215	120	92	121	112	68	40	20	9	12
20		180	171	92	130	112	50	36	17	9	14
21		68	318	92	141	126	71	36	14	9	14
22		50	365	68	156	141	92	36	9	9	14
23		38	243	80	171	156	68	50	14	9	14
24		27	171	92	112	171	68	50	14	9	20
25		36	141	92	158	156	68	50	14	9	20
26	50	50	112	92	204	141	80	50	14	12	20
27	68	36	120	106	188	141	92	92	9	14	20
28	340	27	141	120	171	126	120	68	9	14	14
29	295	27	171		171	112	112	50	9	12	14
30	295	36	204		204	141	112	36	9	9	14
31		50	141		243		112		9	9	

NOTE.—Discharge determined from a rating curve well defined between 15 and 300 second-feet.

Monthly discharge of South Fork of Little Butte Creek near Lakecreek, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
November 26–30	340	50	210	2,080	B.
December	490	27	123	7,560	A.
January	365	50	121	7,440	A.
February	141	68	104	5,780	A.
March	243	68	135	8,300	A.
April	340	112	175	10,400	A.
May	171	50	100	6,150	A.
June	171	36	80.8	4,810	A.
July	20	9	13.3	818	B.
August	14	9	11.2	689	B.
September	20	9	13.7	815	B.
The period				54,800	

LITTLE BUTTE CREEK NEAR EAGLE POINT, OREG.

Location.—In the S. ½ sec. 35, T. 35 S., R. 1 W., 1 mile above Eagle Point, at A. B. Tronson's fruit ranch.

Records available.—July 13, 1907, to September 30, 1911.

Drainage area.—336 square miles. Revised since 1910 report.

Gage.—Vertical staff spiked to alder tree on left bank.

Channel.—Sand at measuring section; solid rock control.

Discharge measurements.—Made from cable suspension bridge 40 feet above gage.

Winter flow.—Unaffected by ice.

Diversions.—A number of small irrigation diversons above the station. The main canal of the Rogue River Valley Canal Co. diverts a considerable part of the flow of the stream past the station; also the pipe line, capacity about 7.5 second-feet, for municipal supply of city of Medford.

Storage.—A small amount developed at Fish Lake but not being used at present.

Accuracy.—Conditions favor accurate estimates.

The following discharge measurement was made by B. F. Heintzleman:

December 5, 1910: Gage height, 2.25 feet; discharge, 387 second-feet.

Daily gage height, in feet, of Little Butte Creek near Eagle Point, Oreg., for the year ending Sept. 30, 1911.

[H. B. Tronson, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug	Sept.
1	1.3	1.2	2.4	1.5	2.2	1.5	2.2	1.65	1.8	1.1	0.75	0.65
2	1.3	1.2	2.0	1.5	4.2	1.4	2.3	1.6	1.7	1.1	.75	.65
3	1.3	1.2	6.3	1.5	3.0	1.4	2.35	1.6	1.7	1.1	.75	.65
4	1.3	1.2	4.0	1.45	2.65	1.3	2.4	1.6	1.6	1.1	.75	.65
5	1.3	1.2	3.3	1.4	2.1	1.3	2.4	1.8	1.6	1.1	.75	.8
6	1.3	1.2	3.1	1.35	1.8	1.3	2.3	1.7	1.6	1.1	.75	.9
7	1.3	1.55	3.7	1.3	1.7	1.85	2.3	1.7	1.6	1.0	.75	.85
8	1.3	1.35	3.5	1.3	1.7	2.05	2.2	1.6	1.5	1.0	.75	.85
9	1.3	1.25	2.8	2.5	1.6	1.85	2.2	1.6	1.5	1.0	.7	.85
10	1.3	1.25	3.0	1.65	1.6	1.75	2.1	1.6	1.4	1.0	.7	.85
11	1.35	1.25	2.3	1.8	1.5	1.65	2.1	1.6	1.3	.95	.7	.85
12	1.4	1.25	2.2	1.7	1.45	1.6	2.0	1.6	1.3	.95	.7	.9
13	1.35	1.25	1.9	1.5	1.55	1.5	2.0	1.6	1.3	.9	.7	.9
14	1.3	1.25	1.9	1.5	1.95	1.5	2.0	1.85	1.3	.9	.7	.8
15	1.3	1.25	1.8	1.5	1.85	1.4	2.0	1.7	1.3	.9	.7	.8
16	1.3	1.25	1.9	1.5	1.8	1.4	1.9	2.6	1.2	.9	.7	.8
17	1.3	1.55	2.0	1.85	1.8	1.4	1.9	2.45	1.2	.9	.7	.8
18	1.25	1.35	2.0	3.0	1.85	1.6	1.8	2.25	1.2	.85	.7	.8
19	1.25	1.25	1.9	8.4	1.75	1.7	1.8	2.1	1.1	.85	.7	.8
20	1.2	1.25	1.85	4.2	1.7	1.8	1.7	2.0	1.1	.85	.7	.8
21	1.2	1.3	1.7	3.6	1.65	1.85	1.7	2.0	1.1	.85	.7	.9
22	1.2	1.4	1.5	2.9	1.65	1.9	1.7	1.9	1.1	.85	.7	.9
23	1.2	3.4	1.5	2.4	1.6	1.9	1.75	1.9	1.35	.85	.7	.9
24	1.2	2.9	1.9	2.3	1.6	2.05	1.85	1.9	1.25	.8	.7	.9
25	1.2	2.5	1.5	1.95	1.6	2.1	1.8	1.8	1.15	.8	.7	1.0
26	1.2	2.5	1.7	1.9	1.6	2.1	1.75	1.8	1.2	.8	.7	1.0
27	1.2	4.6	1.5	2.6	1.6	2.2	1.75	1.7	1.4	.8	.7	1.1
28	1.2	8.3	1.5	3.1	1.5	2.2	1.8	1.7	1.3	.8	.65	1.1
29	1.2	4.7	1.5	3.4	....	2.2	1.8	1.7	1.25	.8	.65	1.0
30	1.2	3.35	1.45	3.2	....	2.2	1.7	1.7	1.2	.75	.65	1.0
31	1.2	....	1.4	2.5	....	2.2	....	1.85	....	.75	.65	....

Daily discharge, in second-feet, of Little Butte Creek near Eagle Point, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	112	93	473	162	388	162	388	205	251	77	40	34
2	112	93	316	162	1,420	136	428	190	220	77	40	34
3	112	93	2,840	162	750	136	450	190	220	77	40	34
4	112	93	1,300	149	587	112	473	190	190	77	40	34
5	112	93	900	136	351	112	473	251	190	77	40	43
6	112	93	800	124	251	112	428	220	190	77	40	52
7	112	176	1,120	112	220	267	428	220	190	63	40	48
8	112	124	1,000	112	220	334	388	190	162	63	40	48
9	112	102	656	518	190	267	388	190	162	63	37	48
10	112	102	750	205	190	236	351	190	136	63	37	48
11	124	102	428	251	162	205	351	190	112	58	37	48
12	136	102	388	220	149	190	316	190	112	58	37	52
13	124	102	283	162	176	162	316	190	112	52	37	52
14	112	102	283	162	300	162	316	267	112	52	37	43
15	112	102	251	162	267	136	316	220	112	52	37	43
16	112	102	283	162	251	136	283	564	93	52	37	43
17	112	176	316	267	251	136	283	496	93	52	37	43
18	102	124	316	750	267	190	251	408	93	48	37	43
19	102	102	283	4,490	236	220	251	351	77	48	37	43
20	93	102	267	1,420	220	251	220	316	77	48	37	43
21	93	112	220	1,060	205	267	220	316	77	48	37	52
22	93	136	162	703	205	283	220	283	77	48	37	52
23	93	950	162	473	190	283	236	283	124	48	37	52
24	93	703	283	428	190	334	267	283	102	43	37	52
25	93	518	162	300	190	351	251	251	85	43	37	63
26	93	518	220	283	190	351	236	251	93	43	37	63
27	93	1,560	162	564	190	388	236	220	136	43	37	77
28	93	4,410	162	800	162	388	251	220	112	43	34	77
29	93	1,730	162	950	....	388	251	220	102	43	34	63
30	93	925	149	850	....	388	220	220	93	40	34	63
31	93	....	136	518	....	388	....	267	....	40	34	....

NOTE.—Discharge determined from a rating curve well defined below 400 second-feet, and fairly well defined between 400 and 1,000 second-feet.

Monthly discharge of Little Butte Creek near Eagle Point, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	136	93	106	6,520	A.
November	4,410	93	461	27,400	B.
December	2,840	136	491	30,200	B.
January	4,490	112	542	33,300	B.
February	1,420	149	299	16,600	A.
March	388	112	241	14,800	A.
April	473	220	316	18,800	A.
May	564	190	259	15,900	A.
June	251	77	130	7,740	A.
July	77	40	55.4	3,410	A.
August	40	34	37.4	2,300	B.
September	77	34	49.7	2,960	A.
The year	4,490	34	247	180,000	

BEAR CREEK AT TALENT, OREG.

Location.—In sec. 23, T. 38 S., R. 1 W., at the highway bridge half a mile northeast of Talent and half a mile below Wagner Creek.

Records available.—July 11, 1907, to August 26, 1911.

Drainage area.—226 square miles.[a]

Gage.—Vertical staff.

Channel.—Sand and gravel; shifting.

Discharge measurements.—Made from the highway bridge or by wading near the gage.

Diversions.—Most of the low-water flow diverted for irrigation above the station.

Accuracy.—Records good for 1911; fair for 1910.

Cooperation.—Maintained in cooperation with Rogue River Valley Canal Co.

Discharge measurements of Bear Creek at Talent, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Nov. 30	B. F. Heintzleman	4.80	260	Apr. 6	B. F. Heintzleman	5.05	250
				14	do	4.72	148
1911.				June 2	do	4.44	94
Feb. 3	B. F. Heintzleman	5.08	255	Aug. 8	Heintzleman and Pierce	3.78	[a] 6

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[a] Incorrectly stated as 212 square miles in 1910 report.

[b] Estimated.

Daily gage height, in feet, of Bear Creek at Talent, Oreg., for the year ending Sept. 30, 1911.

[Clarence Jeffery, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1	3.55	3.65	4.8	4.3	5.25	4.5	5.25	4.6	4.4	4.3	3.8
2	3.55	3.65	4.7	4.3	5.4	4.5	5.2	4.6	4.4	4.25	3.8
3	3.5	3.6	5.45	4.3	5.1	4.6	5.25	4.55	4.4	4.2	3.8
4	3.5	3.65	5.3	4.25	5.0	4.65	5.3	4.5	4.4	4.15	3.8
5	3.5	3.65	4.7	4.2	5.0	4.7	5.2	4.65	4.4	4.1	3.8
6	3.5	3.65	4.6	4.2	4.9	5.2	5.0	4.6	4.4	4.5	3.75
7	3.5	3.6	4.5	4.2	4.85	5.2	4.9	4.6	4.4	4.6	3.75
8	3.5	3.8	4.5	4.25	4.8	5.1	4.9	4.6	4.4	4.0	3.75
9	3.5	3.8	4.9	4.3	4.8	5.1	4.9	4.6	4.4	4.0	3.75
10	3.5	3.8	4.9	4.25	4.9	5.0	4.85	4.6	4.35	4.0	3.75
11	3.65	3.85	4.9	4.2	4.95	4.9	4.8	4.6	4.3	4.0	3.75
12	3.6	3.85	4.6	4.2	4.95	4.8	4.75	4.55	4.3	4.0	3.75
13	3.6	3.85	4.6	4.3	4.9	4.8	4.7	4.55	4.3	4.0	3.75
14	3.6	3.85	4.55	4.3	4.8	4.85	4.7	4.5	4.3	4.0	3.75
15	3.6	3.85	4.5	4.25	4.6	4.9	4.7	4.45	4.3	3.95	3.75
16	3.65	3.85	4.5	4.25	4.6	4.95	4.7	4.5	4.25	3.9	3.75
17	3.65	3.85	4.6	4.5	4.7	5.1	4.7	4.6	4.25	3.85	3.75
18	3.65	3.9	4.5	4.7	4.65	5.06	4.7	4.6	4.2	3.85	3.75
19	3.65	3.8	4.5	6.5	4.65	5.05	4.65	4.6	4.2	3.8	3.77
20	3.65	3.8	4.4	6.0	4.65	5.1	4.6	4.6	4.2	3.8	3.7
21	3.65	3.85	4.4	5.3	4.6	5.2	4.6	4.6	4.2	3.8	3.7
22	3.65	3.9	4.4	5.2	4.6	5.2	4.6	4.55	4.3	3.8	3.7
23	3.65	4.75	4.35	5.1	4.6	5.15	4.6	4.5	4.5	3.8	3.7
24	3.65	4.7	4.45	4.8	4.6	5.1	4.6	4.5	4.4	3.8	3.7
25	3.65	4.3	4.45	4.2	4.6	5.15	4.6	4.5	4.3	4.0	3.65
26	3.65	4.2	4.3	4.7	4.55	5.0	4.65	4.45	4.25	3.95	3.65
27	3.65	4.25	4.35	4.65	4.55	5.0	4.7	4.45	4.45	3.9	....
28	3.65	5.0	4.3	4.8	4.55	5.1	4.65	4.4	4.3	3.85	....
29	3.65	4.7	4.3	5.0	....	5.15	4.65	4.4	4.3	3.85	....
30	3.65	4.8	4.3	5.75	....	5.2	4.6	4.4	4.3	3.8	....
31	3.65	....	4.3	5.6	....	5.25	....	4.4	....	3.8	....

Daily discharge, in second-feet, of Bear Creek at Talent, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1	9.5	19	259	137	310	100	310	124	78	59	6.6
2	9.5	19	232	137	357	100	294	124	78	50	6.6
3	6	13	452	137	263	124	310	112	78	42	6.6
4	6	19	405	126	233	136	325	100	78	35	6.6
5	6	19	232	115	233	149	294	136	78	28	6.6
6	6	19	206	115	204	294	233	124	78	100	5.2
7	6	13	182	115	190	294	204	124	78	124	5.2
8	6	40	182	126	176	263	204	124	78	18	5.2
9	6	40	287	137	176	263	204	124	78	18	5.2
10	6	40	287	126	204	233	190	124	68	18	5.2
11	19	48	287	115	218	204	176	124	59	18	5.2
12	13	48	206	115	218	176	162	112	59	18	5.2
13	13	48	206	137	204	176	149	112	59	18	5.2
14	13	48	194	137	176	190	149	100	59	18	5.2
15	13	48	182	126	124	204	149	89	59	14	5.2
16	19	48	182	126	124	218	149	100	50	11	5.2
17	19	48	206	182	149	263	149	124	50	8.8	5.2
18	19	57	182	232	136	248	149	124	42	8.8	5.2
19	19	40	182	744	136	248	136	124	42	6.6	5.8
20	19	40	159	562	136	263	124	124	42	6.6	3.8
21	19	48	159	325	124	294	124	124	42	6.6	3.8
22	19	57	159	294	124	294	124	112	59	6.6	3.8
23	19	246	148	263	124	278	124	100	100	6.6	3.8
24	19	232	170	176	124	263	124	100	78	6.6	3.8
25	19	137	170	115	124	278	124	100	59	18	2.9
26	19	115	137	149	112	233	136	89	50	14	2.9
27	19	126	148	136	112	233	149	89	89	11	....
28	19	315	137	176	112	263	136	78	59	8.8	....
29	19	232	137	233	....	278	136	78	59	8.8	....
30	19	259	137	475	....	294	124	78	59	6.6	....
31	19	....	137	424	....	310	....	78	....	6.6	....

NOTE.—Discharge determined from two fairly well defined rating curves.

Monthly discharge of Bear Creek at Talent, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	19	6	14.3	879	C.
November	315	13	82.7	4,920	B.
December	452	137	205	12,600	B.
January	744	115	210	12,900	B.
February	357	112	176	9,780	A.
March	310	100	231	14,200	A.
April	325	124	179	10,700	A.
May	136	78	109	6,700	A.
June	100	42	64.8	3,860	A.
July	124	6.6	23.2	1,430	A.
August 1-26	6.6	2.9	5.05	260	B.
The period				78,200	

APPLEGATE CREEK NEAR BUNCOM, OREG.

Location.—In sec. 22, T. 39 S., R. 3 W., at Cameron's ranch, about 3 miles west of Buncom post office, 2½ miles above the confluence of Applegate and Little Applegate creeks and 12 miles southwest of Jacksonville.

Records available.—June 18 to Sept. 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to the downstream side of the bridge pier.

Channel.—Gravel and washed bowlders; fairly permanent.

Discharge measurements.—Made by wading or from wagon bridge.

Diversions.—Cameron's ditch diverts around the gage. Records of discharge in ditch added to give total discharge past this point. A few other diversions farther upstream.

Accuracy.—Results good for low and medium stages.

Discharge measurements of Applegate Creek near Buncom, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
June 9	B. F. Heintzleman	2.81	563
21	.....do	2.40	407
Aug. 7	Pierce and Heintzleman	1.28	57.1

Daily gage height, in feet, and discharge, in second-feet, of Applegate Creek near Buncom, Oreg., for the year ending Sept. 30, 1911.

[W. W. Cameron, observer.]

Day.	June.		July.		August.		September.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge
1	....	....	2.0	244	1.4	77	1.2	44
2	....	....	2.0	244	1.4	77	1.2	44
3	....	....	1.9	211	1.4	77	1.2	44
4	....	....	1.9	211	1.4	77	1.2	44
5	....	....	1.9	211	1.3	59	1.2	44
6	....	....	1.9	211	1.3	59	1.2	44
7	....	....	1.8	180	1.3	59	1.2	44
8	....	....	1.8	180	1.3	59	1.2	44
9	....	....	1.8	180	1.3	59	1.2	44
10	....	....	1.7	151	1.3	59	1.2	44
11	....	....	1.7	151	1.2	44	1.2	44
12	....	....	1.7	151	1.2	44	1.2	44
13	....	....	1.7	151	1.2	44	1.2	44
14	....	....	1.7	151	1.2	44	1.2	44
15	....	....	1.6	124	1.2	44	1.2	44
16	....	....	1.6	124	1.2	44	1.2	44
17	....	....	1.6	124	1.2	44	1.2	44
18	2.6	478	1.6	124	1.2	44	1.2	44
19	2.5	435	1.6	124	1.2	44	1.2	44
20	2.5	435	1.5	99	1.2	44	1.2	44
21	2.4	394	1.5	99	1.2	44	1.2	44
22	2.3	354	1.5	99	1.2	44	1.2	44
23	2.3	354	1.5	99	1.2	44	1.2	44
24	2.3	354	1.5	99	1.2	44	1.2	44
25	2.2	316	1.5	99	1.2	44	1.2	44
26	2.2	316	1.5	99	1.2	44	1.2	44
27	2.2	316	1.5	99	1.2	44	1.2	44
28	2.2	316	1.4	77	1.2	44	1.2	44
29	2.1	279	1.4	77	1.2	44	1.2	44
30	2.1	279	1.4	77	1.2	44	1.2	44
31	....	....	1.4	77	1.2	44	....	....

NOTE.—Discharge determined from a fairly well-defined rating curve.

CAMERON DITCH NEAR BUNCOM, OREG.

Location.—In sec. 22, T. 39 S., R. 3 W., at Cameron's ranch, about 3 miles west of Buncom post office and 12 miles southwest of Jacksonville. This ditch diverts around the gage on Applegate Creek near Buncom, and monthly discharge of the ditch has been added to that of the creek to give total flow.

Records available.—June 18 to September 30, 1911.

Gage.—Vertical staff.

Channel.—Gravel.

Discharge measurements.—Made by wading.

Accuracy.—Results fair.

Discharge measurements of Cameron ditch near Buncom, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
June 21	B. F. Heintzleman	1.06	6.97
Aug. 7	Pierce and Heintzleman	1.34	9.88

Daily gage height, in feet, and discharge, in second-feet, of Cameron ditch near Buncom, Oreg., for the year ending Sept. 30, 1911.

[W. W. Cameron, observer.]

Day.	June.		July.		August.		September.	
	Gage height.	Discharge.	Gage height.	Dis. charge.	Gage height.	Discharge.	Gage height.	Discharge.
1				9.4	1.3	9.4	1.1	7.3
2			1.3	9.4	1.3	9.4	1.1	7.3
3			1.3	9.4	1.3	9.4	1.1	7.3
4			1.3	9.4	1.3	9.4	1.1	7.3
5			1.3	9.4	1.3	9.4	1.1	7.3
6			1.3	9.4	1.3	9.4	1.1	7.3
7			1.3	9.4	1.3	9.4	1.1	7.3
8			1.3	9.4	1.3	9.4	1.1	7.3
9			1.3	9.4	1.3	9.4	1.1	7.3
10			1.3	9.4	1.3	9.4	1.2	8.3
11			1.3	9.4	1.3	9.4	1.2	8.3
12			1.3	9.4	1.3	9.4	1.2	8.3
13			1.3	9.4	1.4	10.5	1.2	8.3
14			1.3	9.4	1.4	10.5	1.3	8.3
15			1.3	9.4	1.4	10.5	1.2	8.3
16			1.3	9.4	1.4	10.5	1.2	8.3
17			1.3	9.4	1.4	10.5	1.1	7.3
18		7.0	1.2	9.4	1.4	10.5	1.1	7.3
19		7.0	1.3	9.4	1.4	10.5	1.1	7.3
20		7.0	1.3	9.4	1.3	9.4	1.3	9.4
21	1.1	7.0	1.3	9.4	1.3	9.4	1.3	9.4
22		7.2	1.3	9.4	1.3	9.4	1.3	9.4
23		7.5	1.4	10.5	1.3	9.4	1.3	9.4
24		7.7	1.4	10.5	1.3	9.4	1.3	9.4
25		8.0	1.4	10.5	1.3	9.4	1.3	9.4
26		8.2	1.4	10.5	1.3	9.4	1.3	9.4
27		8.4	1.3	9.4	1.1	7.3	1.3	9.4
28		8.7	1.3	9.4	1.1	7.3	1.4	10.5
29		8.9	1.3	9.4	1.1	7.3	1.4	10.5
30		9.2	1.1	7.3	1.1	7.3	1.4	10.5
31			1.1	7.3	1.1	7.3		

NOTE.—Discharge determined from a well-defined rating curve. Daily discharge June 18 to June 20, estimated; June 22 to July 1, interpolated. These discharges added to those of Applegate Creek to give total flow.

Monthly discharge of Applegate Creek and Cameron ditch near Buncom, Oreg., for the year ending Sept. 30, 1911.

Applegate Creek.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
June 18-30	478	279	356	9,180
July	244	77	140	8,610
August	77	44	51.2	3,150
September	44	44	44.0	2,620
The period				23,600

Cameron ditch.

Month.	Maximum.	Minimum.	Mean.	Run-off (total in acre-feet).
June 18-30	9.2	7.0	7.83	202
July	10.5	7.3	9.41	560
August	10.5	7.3	9.31	572
September	10.5	7.3	8.41	500
The period				1,840

Monthly discharge of Applegate Creek, including Cameron ditch, near Buncom, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
June 18-30	485	288	364	9,390	A.
July	253	84.3	149	9,160	B.
August	86.4	51.3	60.5	3,720	B.
September	54.5	51.3	52.4	3,120	B.
The period				25,400	

UMPQUA RIVER BASIN.

SOUTH FORK OF UMPQUA RIVER AT TILLER, OREG.

Location.—In sec. 33, T. 30 S., R. 2 W., just above Elk Creek, one-fourth mile above Tiller, and 28 miles above Riddle.

Records available.—November 9, 1910, to November 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Rocks and gravel, practically permanent.

Discharge measurements.—Made by wading near the gage and from the highway bridge just above the gage.

Accuracy.—Rating curve very good.

Discharge measurements of South Fork of Umpqua River at Tiller, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910		*Feet.*	*Sec.-ft.*	1911		*Feet.*	*Sec.-ft.*
Nov. 10	B. F. Heintzleman	2.01	218	Apr. 1	B. F. Heintzleman	4.51	1,750
1911				May 26	do	3.19	874
Jan. 31	do	5.28	2,420	Aug. 11	R. K. Pierce	1.19	59.4

Daily gage height, in feet, of South Fork of Umpqua River at Tiller, Oreg., for the period Nov. 9, 1910, to Nov. 30, 1911.

[H. W. Archambeau, observer.]

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1	......	5.05	3.2	4.8	2.8	4.3	2.8	3.2	2.0	1.4	0.9	1.8	1.1
2	......	4.65	3.2	4.8	2.7	4.2	2.9	3.2	1.9	1.4	.9	1.8	1.1
3	......	7.45	3.1	4.4	3.3	4.3	2.9	3.1	1.9	1.4	.8	1.9	1.1
4	......	7.05	3.1	4.1	3.4	3.6	2.9	3.0	1.8	1.4	.8	1.9	1.1
5	......	5.6	3.0	4.1	3.7	3.5	3.1	2.9	1.8	1.4	1.2	1.8	1.2
6	......	4.7	3.3	4.0	3.8	3.4	3.1	2.8	1.8	1.4	2.0	1.6	1.3
7	......	4.55	3.2	3.8	4.3	3.3	2.9	2.8	1.7	1.4	2.0	1.4	1.4
8	......	4.55	3.2	3.6	4.2	3.1	2.9	2.7	1.7	1.4	2.1	1.4	3.0
9	2.5	5.65	3.2	3.5	4.0	3.2	3.0	2.7	1.7	1.4	2.2	1.6	4.2
10	2.2	4.9	3.2	3.6	3.8	3.2	3.0	2.6	1.7	1.4	2.2	1.8	3.3
11	2.9	4.5	3.2	4.0	3.7	3.1	3.0	2.6	1.7	1.4	1.6	1.7	2.8
12	2.4	4.1	3.2	3.9	3.5	3.1	2.9	2.7	1.6	1.4	1.6	1.6	2.6
13	2.1	3.85	3.0	4.0	3.6	3.0	3.0	2.6	1.6	1.4	1.6	1.5	2.5
14	1.9	3.55	2.9	3.8	3.8	3.0	3.2	2.6	1.5	1.3	1.5	1.5	4.0
15	1.7	3.35	2.8	3.4	4.0	3.0	3.1	2.5	1.5	1.3	1.4	1.4	9.8
16	1.6	3.35	2.8	3.4	4.1	3.2	3.3	2.4	1.5	1.3	1.4	1.4	7.0
17	1.5	4.05	2.7	3.4	4.2	3.3	3.6	2.3	1.5	1.3	1.3	1.4	7.0
18	1.9	3.85	3.8	3.8	4.2	3.2	4.6	2.3	1.5	1.3	1.3	1.3	5.5
19	2.6	3.6	9.6	3.6	4.4	3.2	5.3	2.2	1.5	1.2	1.3	1.3	4.7
20	2.8	3.45	6.2	3.6	4.5	3.1	4.7	2.1	1.4	1.2	1.2	1.3	4.6
21	2.95	3.25	4.9	3.4	4.5	3.0	4.2	2.1	1.4	1.2	1.2	1.3	4.3
22	3.65	3.1	4.2	3.3	4.6	3.1	4.1	2.0	1.4	1.2	1.2	1.3	4.1
23	6.3	3.05	4.0	3.2	4.6	3.1	3.8	2.0	1.4	1.1	1.2	1.3	3.8
24	4.4	3.3	3.8	3.2	4.2	3.3	3.6	2.1	1.4	1.0	1.2	1.3	3.7
25	3.6	3.2	3.8	3.1	3.8	3.5	3.4	2.0	1.4	1.0	1.2	1.3	3.5
26	3.1	3.05	3.6	3.0	3.6	3.4	3.2	1.9	1.4	1.0	1.4	1.2	3.3
27	3.0	3.1	3.6	3.9	3.4	3.2	3.1	2.0	1.4	1.0	1.8	1.1	3.2
28	12.95	3.0	3.6	3.6	3.6	3.0	3.0	2.0	1.4	1.0	1.8	1.1	3.0
29	9.4	2.95	3.5	......	3.7	2.9	3.1	2.0	1.4	.9	1.8	1.1	3.9
30	6.15	3.05	4.2	......	4.1	2.8	3.0	2.1	1.4	.9	1.8	1.1	3.8
31	......	3.2	5.2	......	4.4	......	3.1	......	1.4	.9	......	1.1	......

Daily discharge, in second-feet, of South Fork of Umpqua River at Tiller, Oreg., for the period Nov. 9, 1910, to Nov. 30, 1911.

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1	......	2,250	800	2,020	570	1,580	570	800	230	90	28	175	48
2	......	1,880	800	2,020	520	1,500	625	800	200	90	28	175	48
3	......	4.820	740	1,670	860	1,580	625	740	200	90	20	200	48
4	......	4.360	740	1,420	920	1,050	625	680	175	90	20	200	48
5	......	2,800	680	1,420	1,120	985	740	625	175	90	60	175	60
6	......	1,930	860	1,340	1,190	920	740	570	175	90	230	130	74
7	......	1,800	800	1,190	1.580	860	625	570	150	90	230	90	90
8	......	1,800	800	1,050	1,500	740	625	520	150	90	260	90	680
9	420	2,850	800	985	1,340	800	680	520	150	90	295	130	1,500
10	295	2,110	800	1,050	1,190	800	680	470	150	90	295	175	860
11	625	1,760	800	1,340	1,120	740	680	470	150	90	130	150	570
12	375	1,420	800	1,260	985	740	625	520	130	90	130	130	470
13	260	1,230	680	1,340	1,050	680	680	470	130	90	130	110	420
14	200	1,020	625	1,190	1,190	680	800	470	110	74	110	110	1,340
15	150	890	570	920	1,340	680	740	420	110	74	90	90	7,610
16	130	890	570	920	1,420	800	860	375	110	74	90	90	4,300
17	110	1,380	520	920	1,500	860	1,050	335	110	74	74	90	4,300
18	200	1,230	1,190	1,190	1,500	800	1,840	335	110	74	74	74	2,700
19	470	1,050	7,370	1,050	1,670	800	2,500	295	110	60	74	74	1,930
20	570	952	3,420	1,050	1,760	740	1,930	260	90	60	60	74	1,840
21	652	830	2,110	920	1,760	680	1,500	260	90	60	60	74	1,580
22	1,080	740	1,500	860	1,840	740	1,420	230	90	60	60	74	1,420
23	3,530	710	1,340	800	1,840	740	1,190	230	90	48	60	74	1,190
24	1,670	860	1.190	800	1,500	860	1,050	260	90	37	60	74	1,120
25	1,050	800	1,190	740	1,190	985	920	230	90	37	60	74	985
26	740	710	1,050	680	1,050	920	800	200	90	37	90	60	860
27	680	740	1,050	1,260	920	800	740	230	90	37	175	48	800
28	11,400	680	1,050	1,050	1,050	680	680	230	90	37	175	48	680
29	7,130	652	985	......	1,120	625	740	230	90	28	175	48	1,260
30	3,360	710	1,500	......	1,420	570	680	260	90	28	175	48	1,190
31	......	800	2,400	......	1,670	......	740	......	90	28	......	48	......

NOTE.—Discharge determined from a rating curve well defined between 40 and 3,200 second-feet.

Monthly discharge of South Fork of Umpqua River near Tiller, Oreg., for the period Nov. 9, 1910, to Nov. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
November 9-30	11,400	110	1,600	69,800	B.
December	4,820	652	1,500	92,200	A.
January	7,370	520	1,280	78,700	A.
February	2,020	680	1,160	64,400	A.
March	1,840	520	1,280	78,700	A.
April	1,580	570	864	51,400	A.
May	2,500	570	926	56,900	A.
June	800	200	420	25,000	A.
July	230	90	126	7,750	A.
August	90	28	67.6	4,160	B.
September	295	20	117	6,960	A.
The period				536,000	
October	200	48	103	6,330	A.
November	7,610	48	1,330	79,100	A.

SOUTH FORK OF UMPQUA RIVER NEAR BROCKWAY, OREG.

Location.—In sec. 15, T. 28 S., R. 6 W., at Winston's Bridge, 6 miles south of Roseburg, 3 miles below Lookingglass Creek, 10 miles below Myrtle Creek, 3 miles east of Brockway, and 18 miles above the confluence of the North and South forks.

Records available.—December 6, 1905, to September 30, 1911.

Drainage area.—1,800 square miles.

Gage.—Chain gage on bridge since November 20, 1910. Originally a staff gage in two sections, the lower inclined and the upper vertical. The datum of the chain gage is 1.0 foot lower than that of the staff gage. Gage heights for November 20 to December 31, 1910, have been reduced to the datum of the staff gage.

Channel.—One channel at all stages. Bed of stream at control, one-fourth mile below stations, composed of bowlders. No shifting. Good measuring section.

Discharge measurements.—Made from highway bridge at gage.

Accuracy.—Gage record reliable; rating curve well defined.

Discharge measurements of South Fork of Umpqua River near Brockway, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*
Nov. 11[a]	B. F. Heintzleman	1.74	798
1911.			
Mar. 30	....do	4.44	2,140
Sept. 6	R. W. Davenport	1.08	147

[a] Date doubtful; may have been Nov. 20.

Daily gage height, in feet, of South Fork of Umpqua River near Brockway, Oreg., for the year ending Sept. 30, 1911.

[Geo. W. Brosi, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	0.05	6.2	5.1	7.6	4.2	4.9	3.3	3.2	1.9	0.85	0.7
2	......	.05	5.1	5.0	7.6	3.9	4.7	3.2	3.0	1.85	.85	.65
3	0.1	.05	8.05	4.9	7.1	4.0	4.6	3.1	3.1	1.85	.8	.7
4	.65	.1	10.0	4.5	6.6	4.0	4.6	3.2	3.1	1.75	.85	.75
5	.65	.1	7.5	4.4	6.2	5.0	4.4	3.2	3.0	1.65	.85	.8
6	.65	.15	6.0	4.3	6.2	5.3	4.1	3.4	2.9	1.7	.95	1.55
7	.6	.25	5.1	4.2	5.9	5.3	3.7	3.4	2.9	1.6	.9	1.45
8	.55	.65	3.7	4.2	5.6	6.2	4.0	3.6	2.8	1.5	.8	1.4
9	.5	1.6	6.1	4.2	5.5	6.2	3.9	3.4	2.5	1.45	.75	1.4
10	.4	2.0	5.5	4.8	5.3	6.1	3.8	3.3	2.5	1.45	.75	1.35
11	.4	1.55	4.9	5.1	5.6	5.9	4.6	3.4	2.5	1.4	.7	1.25
12	.5	1.65	4.5	4.8	6.0	5.5	4.5	3.4	2.5	1.4	.7	1.3
13	.65	1.7	4.1	4.6	6.3	5.5	4.5	3.2	2.6	1.3	.7	1.55
14	.65	1.65	3.8	4.3	6.2	5.4	4.4	3.3	2.6	1.25	.7	1.6
15	.6	1.65	3.5	4.3	5.8	5.4	4.4	3.4	2.4	1.25	.7	1.6
16	.55	1.6	3.6	4.4	5.6	5.4	4.6	3.4	2.35	1.2	.65	1.5
17	.5	1.6	4.1	4.6	5.4	5.2	4.5	3.5	2.3	1.2	.7	1.4
18	.45	1.65	4.0	5.4	5.5	5.3	4.8	3.9	2.25	1.25	.65	1.4
19	.4	2.2	3.7	13.6	5.8	5.3	4.8	6.0	2.1	1.2	.65	1.4
20	.35	1.8	3.5	14.5	5.5	5.2	4.5	5.7	1.95	1.15	.75	1.35
21	.2	1.6	3.3	9.2	5.5	5.2	4.4	5.2	1.95	1.15	.7	1.25
22	.15	2.2	3.1	7.5	5.4	5.1	4.2	4.8	1.95	1.15	.75	1.1
23	.15	2.9	2.95	6.6	4.9	5.2	4.1	4.3	1.85	1.15	.7	1.0
24	.1	5.25	2.9	5.9	4.8	5.0	4.0	4.3	1.85	1.1	.65	.9
25	.1	4.0	3.15	5.8	4.5	4.9	4.0	3.8	1.8	1.05	.65	.75
26	.1	3.2	3.1	6.0	4.6	4.8	4.0	3.6	1.8	1.05	.65	.9
27	.1	2.65	3.05	6.0	4.4	4.5	3.8	3.4	1.95	1.05	.7	1.15
28	.05	2.5	3.15	7.4	4.3	4.5	3.8	3.4	2.05	1.1	.65	1.8
29	.05	15.2	3.2	6.7	......	4.4	3.6	3.3	1.95	1.05	.65	1.6
30	.05	8.8	3.25	6.5	......	4.3	3.3	3.1	1.9	.95	.65	1.35
31	.05	......	3.9	8.2	......	......	......	3.2	......	.9	.65	......

Daily discharge, in second-feet, of South Fork of Umpqua River near Brockway, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	150	160	7,470	3,050	8,510	1,900	2,750	1,140	1,070	428	123	98
2	150	160	4,860	2,900	8,510	1,610	2,470	1,070	940	409	123	90
3	170	160	12,700	2,750	7,190	1,700	2,340	1,000	1,000	409	114	98
4	336	170	18,800	2,220	5,960	1,700	2,340	1,070	1,000	372	123	106
5	336	170	11,100	2,110	5,060	2,900	2,110	1,070	940	336	123	114
6	336	182	6,940	2,000	5,060	3,370	1,800	1,210	880	354	141	301
7	318	207	4,860	1,900	4,450	3,370	1,440	1,210	880	318	132	267
8	301	336	2,480	1,900	3,890	5,060	1,700	1,360	820	284	114	250
9	284	715	7,210	1,900	3,710	5,060	1,610	1,210	670	267	106	250
10	250	940	5,730	2,610	3,370	4,850	1,520	1,140	670	267	106	235
11	250	692	4,460	3,050	3,890	4,450	2,340	1,210	670	250	98	207
12	284	740	3,710	2,610	4,650	3,710	2,220	1,210	670	250	98	220
13	336	765	3,050	2,340	5,280	3,710	2,220	1,070	715	220	98	301
14	336	740	2,610	2,000	5,060	3,540	2,110	1,140	715	207	98	318
15	318	740	2,220	2,000	4,260	3,540	2,110	1,210	627	207	98	318
16	301	715	2,340	2,110	3,890	3,540	2,340	1,210	606	194	90	284
17	284	715	3,050	2,340	3,540	3,210	2,220	1,280	585	194	98	250
18	267	740	2,900	3,540	3,710	3,370	2,610	1,610	564	207	90	250
19	250	1,070	2,470	27,300	4,260	3,370	2,610	4,650	504	194	90	250
20	235	820	2,220	30,300	3,710	3,210	2,220	4,070	447	182	106	235
21	194	715	2,000	13,100	3,710	3,210	2,110	3,210	447	182	98	207
22	182	1,070	1,800	8,240	3,540	3,050	1,900	2,610	447	182	106	170
23	182	1,610	1,660	5,960	2,750	3,210	1,800	2,000	409	182	98	150
24	170	5,170	1,610	4,450	2,610	2,900	1,700	2,000	409	170	90	132
25	170	2,900	1,850	4,260	2,220	2,750	1,700	1,520	390	160	90	106
26	170	1,900	1,800	4,650	2,340	2,610	1,700	1,360	390	160	90	132
27	170	1,400	1,750	4,650	2,110	2,220	1,520	1,210	447	160	98	182
28	160	1,280	1,850	7,970	2,000	2,220	1,520	1,210	485	170	90	390
29	160	36,100	1,900	6,200	......	2,110	1,360	1,140	447	160	90	318
30	160	15,000	1,950	5,730	......	2,000	1,140	1,000	428	141	90	235
31	160	......	2,750	10,200	......	2,380	......	1,070	......	132	90	......

NOTE.—Discharge determined from a rating curve well defined between 80 and 16,000 second-feet.

Monthly discharge of South Fork of Umpqua River near Brockway, Oreg., for the year ending Sept. 30, 1911.

[Drainage area, 1,800 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	336	150	238	0.132	0.15	14,600	A.
November	36,100	160	2,600	1.44	1.61	155,000	B.
December	18,800	1,610	4,260	2.37	2.73	262,000	A.
January	30,300	1,900	5,690	3.16	3.64	350,000	B.
February	8,510	2,000	4,260	2.37	2.47	237,000	A.
March	5,060	1,610	3,090	1.72	1.98	190,000	A.
April	2,750	1,140	1,980	1.10	1.23	118,000	A.
May	4,650	1,000	1,560	.867	1.00	95,900	A.
June	1,070	390	642	.357	.40	38,200	A.
July	428	132	237	.132	.15	14,600	A.
August	141	90	103	.057	.07	6,330	A.
September	390	90	215	.119	.13	12,800	A.
The year	36,100	90	2,060	1.14	15.56	1,490,000	

UMPQUA RIVER NEAR ELKTON, OREG.

Location.—In sec. 8, T. 23 S., R. 7 W., at the falls in the river, 4 miles south (by road) from Elkton and 8 miles (by river) above Elk Creek.

Records available.—October 18, 1905, to December 31, 1906, and May 12, 1907, to September 30, 1911.

Drainage area.—3,680 square miles.

Gage.—Staff in five sections. Low-water section inclined, the others vertical. Datum lowered 0.52 foot September 2, 1910.

Channel.—Gravel; shifting not material.

Discharge measurements.—Made from ferry 100 feet below gage.

Accuracy.—Gage record reliable; rating curve fairly well defined.

Cooperation.—Gage readings furnished by J. G. Kelley, of Portland, Oreg.

Discharge measurements of Umpqua River near Elkton, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
1910		*Feet.*	*Sec.-ft.*
Nov. 14	B. F. Heintzleman	[a] 1.60	2,740
1911			
June 27	....do	1.46	2,190
Aug. 21	R. C. Pierce	.34	1,060

[a] Published incorrectly in 1910 report.

Daily gage height, in feet, of Umpqua River near Elkton, Oreg., for the year ending Sept. 30, 1911.

[D. C. Higginbotham, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.2	0.3	9.5	5.4	6.0	3.4	3.0	3.6	2.7	1.2	0.4	0.2
2	.15	.35	7.5	4.6	6.4	3.1	3.1	3.0	2.4	1.2	.4	2
3	.15	.4	8.0	4.4	6.6	3.6	4.4	3.1	2.2	1.4	.4	.2
4	.3	.4	10.5	4.0	8.6	3.0	4.2	3.2	2.2	1.4	.3	.2
5	1.2	.35	7.5	3.7	8.4	3.2	4.2	4.0	2.4	1.2	.4	.6
6	1.3	.4	5.5	3.4	7.6	3.2	4.0	4.4	2.1	1.2	.4	1.0
7	.8	.5	3.5	3.5	7.2	3.2	4.0	3.4	2.6	1.2	.3	1.1
8	.6	.5	5.5	4.0	6.2	4.0	4.0	3.1	2.4	1.0	.4	.8
9	.5	1.6	6.7	4.4	6.6	4.6	3.1	3.6	2.4	1.1	.4	.6
10	.4	5.1	7.7	5.2	6.2	5.9	4.0	3.2	2.8	1.0	.3	.6
11	.3	4.15	6.5	5.4	5.1	5.0	4.1	3.5	2.4	.9	.2	.4
12	.4	3.2	5.65	5.2	5.6	4.4	4.4	4.4	2.6	.8	.2	.6
13	.55	3.1	4.1	4.7	6.5	5.0	4.0	3.6	2.2	.8	.3	.8
14	.6	2.75	5.5	4.6	6.4	5.2	4.1	3.1	2.0	.7	.2	.8
15	.7	2.35	7.5	4.1	5.6	6.1	4.0	3.1	1.4	.6	.4	.6
16	.8	2.1	7.0	5.0	5.1	6.2	4.5	3.1	1.4	.6	.4	.5
17	.7	2.25	5.65	5.2	5.6	5.6	5.1	4.2	1.3	.6	.4	.5
18	.6	1.7	5.1	6.4	5.2	5.3	5.2	4.4	1.3	.6	.3	.4
19	.6	1.2	5.6	7.0	5.2	5.0	5.7	7.2	1.1	.4	.2	.4
20	.5	1.3	5.1	11.5	5.4	5.2	5.4	7.4	1.6	.4	.2	.4
21	.4	1.5	6.5	21.0	5.6	5.3	4.7	5.6	1.2	.4	.2	.4
22	.4	1.3	6.0	10.5	5.6	5.6	4.2	4.6	1.5	.3	.2	.4
23	.4	2.2	5.35	9.4	5.1	5.0	4.1	4.1	1.7	.3	.2	.4
24	.3	5.0	5.1	8.7	5.6	5.1	4.6	4.6	1.4	.4	.2	.3
25	.3	9.5	5.65	8.1	5.0	5.0	3.9	3.7	1.2	.6	.2	.4
26	.35	4.5	4.7	8.6	4.2	4.2	3.2	3.2	1.5	.6	.2	.6
27	.4	7.0	4.25	7.7	4.1	4.1	3.2	3.7	1.4	.4	.2	.8
28	.5	9.5	4.1	7.4	4.0	4.6	3.4	3.5	1.4	.4	.2	1.3
29	.4	19.5	4.65	7.2	......	4.2	3.2	2.9	1.4	.4	.2	1.4
30	.4	20.0	4.4	6.4	......	3.6	3.4	2.4	1.2	.4	.2	.8
31	.3	......	4.05	6.2	......	3.3	......	2.1	......	.3	.2	......

Daily discharge, in second-feet, of Umpqua River near Elkton, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1,000	1,080	24,600	9,960	11,400	5,350	4,600	5,760	4,080	1,970	1,150	980
2	960	1,120	17,600	8,040	12,400	4,780	4,780	4,600	3,600	1,970	1,150	980
3	960	1,160	19,300	7,560	12,900	5,760	7,560	4,780	3,300	2,200	1,150	980
4	1,080	1,160	28,400	6,640	18,200	4,600	7,100	4,970	3,300	2,200	1,060	980
5	1,960	1,120	17,600	5,980	17,600	4,970	7,100	6,640	3,600	1,970	1,150	1,340
6	2,080	1,160	11,300	5,350	15,400	4,970	6,640	7,560	3,140	1,970	1,150	1,750
7	1,520	1,240	6,070	5,550	14,400	4,970	6,640	5,350	3,910	1,970	1,060	1,860
8	1,330	1,240	11,300	6,640	11,900	6,640	6,640	4,780	3,600	1,750	1,150	1,540
9	1,240	1,330	15,000	7,560	12,900	8,040	6,870	5,760	3,600	1,860	1,150	1,340
10	1,160	10,200	18,300	9,480	11,900	11,200	6,640	4,970	4,250	1,750	1,060	1,340
11	1,080	7,620	14,400	9,960	9,240	9,000	6,870	5,550	3,600	1,640	980	1,150
12	1,160	5,380	11,800	9,480	10,400	7,560	7,560	7,560	3,910	1,540	980	1,340
13	1,280	5,160	7,500	8,280	12,600	9,000	6,640	5,760	3,300	1,540	1,060	1,540
14	1,330	4,420	11,300	8,040	12,400	9,480	6,870	4,780	3,000	1,440	980	1,540
15	1,420	3,670	17,600	6,870	10,400	11,600	6,640	4,780	2,200	1,340	1,150	1,340
16	1,520	3,240	16,000	9,000	9,240	11,900	7,800	4,780	2,200	1,340	1,150	1,240
17	1,420	3,500	11,800	9,480	10,400	10,400	9,240	7,100	2,080	1,340	1,150	1,240
18	1,330	2,610	10,200	12,400	9,480	9,720	9,480	7,560	2,080	1,340	1,060	1,150
19	1,330	1,960	11,600	13,900	9,480	9,000	10,700	14,400	1,860	1,150	980	1,150
20	1,240	2,080	10,200	27,000	9,960	9,480	9,960	14,900	2,460	1,150	980	1,150
21	1,160	2,340	14,400	61,900	10,400	9,720	8,280	10,400	1,970	1,150	980	1,150
22	1,160	2,080	12,800	23,700	10,400	10,400	7,100	8,040	2,330	1,060	980	1,150
23	1,160	3,410	10,900	20,500	9,240	9,000	6,870	6,870	2,580	1,060	980	1,150
24	1,080	9,880	10,200	18,400	10,400	9,240	8,040	8,040	2,200	1,150	980	1,060
25	1,080	24,600	11,800	16,800	9,000	9,000	6,420	5,980	1,970	1,340	980	1,150
26	1,120	8,500	9,040	18,200	7,100	7,100	4,970	4,970	2,330	1,340	980	1,340
27	1,160	16,000	7,880	15,700	6,870	6,870	4,970	5,980	2,200	1,150	980	1,540
28	1,240	24,600	7,500	14,900	6,640	8,040	5,350	5,550	2,200	1,150	980	2,080
29	1,160	64,001	8,900	14,400	......	7,100	4,970	4,420	2,200	1,150	980	2,200
30	1,160	66,200	8,250	12,400	......	5,760	5,350	3,600	1,970	1,150	980	1,540
31	1,080	......	7,380	11,900	......	5,160	......	3,140	......	1,060	980	......

NOTE.—Discharge determined from two rating curves well defined below 20,000 second-feet.

Monthly discharge of Umpqua River near Elkton, Oreg., for the year ending Sept. 30, 1911.

[Drainage area, 3,680 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	2,080	960	1,260	0.342	0.39	77,500	A.
November	66,200	1,080	9,410	2.56	2.86	579,000	B.
December	28,400	6,070	12,900	3.51	4.05	560,000	B.
January	61,900	5,350	13,400	3.64	4.20	824,000	B.
February	18,200	6,640	11,200	3.04	3.17	622,000	A.
March	11,900	4,600	7,930	2.15	2.48	488,000	A.
April	10,700	4,600	6,960	1.89	2.11	414,000	A.
May	14,900	3,140	6,430	1.75	2.02	395,000	A.
June	4,250	1,860	2,830	.769	.86	168,000	A.
July	2,200	1,060	1,490	.405	.47	91,600	A.
August	1,150	980	1,050	.285	.33	64,600	A.
September	2,200	980	1,340	.364	.41	79,700	A.
The year	66,200	960	6,320	1.72	23.35	4,360,000	

COW CREEK AT RIDDLE, OREG.

Location.—In sec. 24, T. 30 S., R. 6 W., at the highway bridge in the town of Riddle.

Records available.—August 20 to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Gravel and sand; shifting.

Discharge measurements.—Made from highway bridge or by wading near gage.

Diversions.—Some small irrigation ditches above station.

Estimates withheld until additional data can be obtained.

The following discharge measurement was made by R. C. Pierce:

August 20, 1911: Gage height, 1.70 feet; discharge, 32.8 second-feet.

Daily gage height, in feet, of Cow Creek at Riddle, Oreg., for the year ending Sept. 30, 1911.

Day.	Aug.	Sept.	Day.	Aug.	Sept.	Day.	Aug.	Sept.
1		1.66	11		1.80	21	1.70	1.79
2		1.68	12		1.98	22	1.70	1.81
3		1.66	13		2.10	23	1.69	1.81
4		1.68	14		1.98	24	1.68	1.81
5		1.75	15		1.90	25	1.67	1.83
6		1.81	16		1.88	26	1.67	1.85
7		1.80	17		1.87	27	1.70	1.89
8		1.80	18		1.82	28	1.68	1.88
9		1.80	19		1.80	29	1.67	1.87
10		1.80	20	1.70	1.80	30	1.66	1.87
						31	1.66	

NORTH FORK OF UMPQUA RIVER NEAR HOAGLIN, OREG.

Location.—In sec. 18, T. 26 S., R. 1 W., one-fourth mile above the forest boundary, 10 miles above Hoaglin, and about 9 miles below Steamboat Creek.

Records available.—February 20 to March 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Rocky and deep; practically permanent.

Discharge measurements.—Made from cable above gage.

Accuracy.—Gage-height record fragmentary; rating curve well defined.

Cooperation.—Maintained in cooperation with the United States Forest Service.

Discharge measurements of North Fork of Umpqua River near Hoaglin, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 21	B. F. Heintzleman	3.15	2,000
Mar. 28	.....do	3.54	2,410
May 30	.....do	3.65	2,590
Aug. 17	R. C. Pierce	1.98	867

Daily gage height, in feet, and discharge, in second-feet, of North Fork of Umpqua River, near Hoaglin, Oreg., for the year ending Sept. 30, 1911.

Day.	February.		March.		Day.	February.		March.	
	Gage height.	Discharge.	Gage height.	Discharge.		Gage height.	Discharge.	Gage height.	Discharge.
1				1,420	16			4.15	3,340
2			2.6	1,380	17				3,460
3				1,550	18				3,590
4				1,720	19				3,720
5				1,900	20	3.25	2,060	4.45	3,840
6				2,080	21	3.15	1,940		3,710
7				2,260	22		1,860		3,580
8				2,430	23		1,770		3,440
9			3.65	2,600	24		1,690		3,300
10				2,460	25		1,600		3,170
11				2,320	26	2.75	1,520	3.95	3,040
12			3.35	2,180	27		1,480		2,750
13				2,470	28		1,450	3.55	2,460
14				2,760	29				2,950
15				3,050	30				3,440
					31			4.5	3,930

NOTE.—Discharge determined from a rating curve well defined below 3,000 second-feet.

Monthly discharge of North Fork of Umpqua River, near Hoaglin, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
February 20-28	2,060	1,450	1,710	30,500	B.
March	3,930	1,380	2,780	171,000	B.

NORTH FORK OF UMPQUA RIVER AT WINCHESTER, OREG.

Location.—In sec. 25, T. 26 S., R. 6 W., at Southern Pacific Railroad bridge in Winchester, 300 yards below power plant and 400 yards below the highway bridge; about 5 miles north of Roseburg.

Records available.—November 10, 1908, to September 30, 1911. September 6, 1905, to October 10, 1908, at Oakcreek station, about 10 miles above present station.

Drainage area.—1,080 square miles.

Gage.—Vertical staff in three sections, bolted to left face of left railroad bridge pier, lower section reading 0 to 3.1, middle 3.0 to 18.0, and upper 18.0 to 23.0 feet.

Channel.—Rock and gravel; practically permanent; one channel at high and low stages, two at medium.

Discharge measurements.—Made from railroad bridge at low and medium stages; in higher water from highway bridge.

Estimates withheld for further data.

Discharge measurements of North Fork of Umpqua River at Winchester, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*
Nov. 12	B. F. Heintzleman	2.86	2,140
1911.			
June 26	do	2.54	1,700
Aug. 14	R. C. Pierce	1.70	960

Daily gage height, in feet, of North Fork of Umpqua River at Winchester, Oreg., for the year ending Sept. 30, 1911.

[W. J. Pearson, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.7	1.6	5.8	3.8	4.8	2.8	4.8	3.2	3.9	2.65	1.85	1.6
2	1.7	1.6	5.05	3.6	5.3	2.8	4.5	3.35	3.9	2.5	1.85	1.6
3	1.8	1.65	7.55	3.5	4.6	2.75	4.2	3.45	3.75	2.45	1.85	1.7
4	3.0	1.6	8.7	3.35	4.4	3.0	4.0	3.3	3.75	2.35	1.8	1.65
5	2.3	1.65	6.4	3.4	4.3	3.8	3.7	3.6	3.5	2.35	1.8	2.0
6	2.0	1.65	5.3	3.45	4.3	3.95	3.6	3.75	3.45	2.3	1.8	3.0
7	1.9	1.65	4.85	3.4	3.9	4.2	3.5	3.5	3.35	2.3	1.75	2.1
8	1.8	3.8	4.5	3.35	3.25	4.2	3.4	3.55	3.35	2.25	1.75	1.85
9	1.75	3.5	6.6	3.55	3.4	4.0	3.45	3.75	3.3	2.25	1.75	1.8
10	1.7	2.7	5.45	3.65	3.4	3.85	3.5	3.8	3.2	2.25	1.75	2.0
11	1.8	3.25	4.85	3.65	4.2	3.7	3.6	3.7	3.3	2.2	1.75	1.8
12	2.15	2.9	4.4	3.45	3.85	3.6	3.5	3.6	3.35	2.2	1.7	1.8
13	2.3	2.5	4.05	3.3	4.3	3.6	3.5	3.9	3.4	2.15	1.7	1.9
14	2.0	2.3	3.8	3.1	4.0	3.75	3.5	3.9	3.35	2.15	1.7	1.85
15	1.85	2.15	3.55	3.1	3.8	4.2	3.5	3.8	3.25	2.1	1.75	1.8
16	1.75	2.1	3.45	3.05	3.6	4.4	4.0	3.75	3.1	2.1	1.75	1.9
17	1.8	2.0	5.05	3.15	3.5	4.4	3.95	4.2	3.0	2.1	1.7	1.75
18	1.8	2.0	4.7	3.75	4.1	4.4	3.85	6.2	2.95	2.05	1.7	1.7
19	1.9	2.7	4.1	10.2	3.95	4.3	3.85	7.0	2.85	2.05	1.7	1.65
20	1.75	2.55	3.95	7.8	3.8	4.6	3.6	5.5	2.75	2.0	1.7	1.65
21	1.85	3.25	3.8	5.1	3.6	4.7	3.6	5.3	2.7	2.0	1.7	1.6
22	1.7	4.25	3.7	4.4	3.35	4.6	3.55	5.0	2.7	2.0	1.7	1.6
23	1.75	9.7	3.45	3.95	3.3	4.8	3.7	5.4	2.65	1.95	1.65	1.6
24	1.75	5.35	3.8	3.75	3.15	4.7	3.8	4.8	2.7	1.95	1.65	1.6
25	1.7	4.0	3.7	3.8	3.2	4.5	4.0	3.95	2.65	1.9	1.65	1.6
26	1.65	3.55	3.55	3.75	3.1	4.2	3.9	3.75	2.55	1.9	1.65	2.2
27	1.65	3.35	3.7	3.7	3.1	3.8	3.7	3.6	2.6	1.9	1.65	2.4
28	1.6	15.5	3.35	3.75	2.9	3.6	3.5	3.55	2.65	1.9	1.65	2.1
29	1.6	13.3	3.5	3.7	....	3.6	3.4	3.5	2.55	1.85	1.65	1.95
30	1.65	7.8	3.5	3.95	....	4.1	2.3	3.55	2.7	1.85	1.6	1.8
31	1.65	....	3.9	5.2	....	4.6	....	3.65	....	1.85	1.6	....

MILL CREEK NEAR ASH, OREG.

Location.—In sec. 11, T. 23 S., R. 10 W., at the outlet of Loon Lake, about 12 miles south of Scottsburg.

Records available.—May 29, 1907, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Bowlders and gravel; shifting.

Discharge measurements.—Made by wading. No equipment provided for high-water measurements.

Cooperation.—Maintained in cooperation with J. G. Kelley, of Portland, Oreg.

Estimates withheld for additional data.

Discharge measurements of Mill Creek near Ash, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*
Nov. 16	B. F. Heintzleman	5.30	98.7
1911.			
June 29	....do	4.34	38.3
Aug. 23	R. C. Pierce	3.03	5.4

Daily gage height, in feet, of Mill Creek near Ash, Oreg., for the year ending Sept. 30, 1911.

[John Salander, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.1	3.0	10.4	8.0	8.8	6.3	5.0	5.2	5.65	4.3	3.25	2.80
2	2.1	3.0	9.0	8.0	8.9	6.2	4.9	5.2	5.55	4.25	3.22	2.80
3	2.15	3.0	8.7	7.6	8.9	6.1	4.9	5.2	5.45	4.2	3.20	2.78
4	2.5	2.95	10.0	7.3	8.5	6.0	4.9	5.2	5.35	4.15	3.20	2.78
5	2.9	2.9	9.7	7.1	8.2	5.95	5.3	5.2	5.25	4.1	3.20	2.85
6	3.1	2.9	8.9	6.9	8.5	5.9	5.3	5.3	5.15	4.05	3.18	2.94
7	3.1	3.05	8.2	6.7	8.2	6.0	5.25	5.3	5.1	4.0	3.18	3.05
8	3.1	4.3	7.85	6.5	8.2	6.2	5.2	5.3	5.05	3.98	3.15	3.10
9	3.2	6.4	8.0	6.6	7.9	6.3	5.1	5.8	5.05	3.92	3.15	3.10
10	3.2	6.4	7.9	7.7	7.7	6.4	5.5	6.0	4.95	3.88	3.12	3.10
11	3.2	7.8	7.7	8.0	7.5	6.4	6.5	6.0	4.9	3.85	3.10	3.10
12	3.2	7.5	7.4	8.0	7.7	6.3	7.3	5.9	4.85	3.82	3.10	3.20
13	3.4	6.7	7.1	7.7	7.9	6.2	7.3	5.8	4.75	3.80	3.08	3.45
14	3.6	6.2	6.9	7.3	8.3	6.1	7.2	5.7	4.7	3.78	3.08	3.70
15	3.7	6.1	6.7	7.1	8.1	6.0	7.1	5.55	4.65	3.72	3.08	3.75
16	3.6	5.3	6.6	6.9	7.9	5.9	7.0	5.45	4.6	3.70	3.05	3.78
17	3.5	5.15	7.1	7.15	7.7	5.95	6.9	5.45	4.6	3.68	3.02	3.80
18	3.6	5.05	7.3	11.2	7.8	5.85	6.75	6.1	4.55	3.65	3.02	3.80
19	3.6	5.05	7.1	14.2	7.9	5.75	6.65	9.2	4.5	3.62	3.00	3.70
20	3.5	5.2	6.85	13.0	7.6	5.6	6.5	9.0	4.45	3.58	3.00	3.68
21	3.5	5.8	6.7	11.5	7.4	5.5	6.3	8.1	4.45	3.52	2.98	3.55
22	3.4	7.8	6.5	9.6	7.2	5.4	6.2	7.6	4.4	3.50	2.98	3.48
23	3.35	8.8	6.4	8.7	7.0	5.4	6.0	7.2	4.35	3.48	2.95	3.40
24	3.3	9.7	6.4	8.1	6.8	5.4	5.9	7.0	4.3	3.45	2.95	3.38
25	3.25	8.5	6.5	7.9	6.7	5.4	5.8	6.7	4.3	3.42	2.92	3.35
26	3.2	7.5	6.5	7.9	6.6	5.4	5.65	6.5	4.25	3.40	2.90	3.35
27	3.15	7.1	6.6	7.8	6.5	5.3	5.55	6.3	4.25	3.38	2.90	3.45
28	3.1	10.5	6.6	9.0	6.4	5.2	5.5	6.1	4.3	3.35	2.88	3.55
29	3.1	13.4	6.6	9.3	......	5.1	5.4	5.9	4.3	3.32	2.88	3.55
30	3.05	12.0	6.6	8.7	......	5.05	5.3	5.8	4.35	3.30	2.85	3.50
31	3.0	......	7.1	8.7	......	5.0	......	5.7	......	3.28	2.82	......

SILETZ RIVER BASIN.

SILETZ RIVER AT SILETZ, OREG.

Location.—In sec. 9, T. 10 S., R. 10 W., about 1 mile above the ferry at Siletz, 6 miles below Rock Creek, and about 9 miles north of Toledo, the nearest railroad point.

Records available.—November 25, 1905, to September 30, 1911.

Drainage area.—220 square miles.

Gage.—Staff in two sections—the lower inclined, the upper vertical.

Channel.—Coarse gravel and sand; shifting.

Discharge measurements.—Made from a cable at the gage prior to fall flood of 1909; since then by wading, as equipment was destroyed.

Accuracy—Results fair.

The following discharge measurement was made by Allen and Myers:

October 21, 1910: Gage height, 1.80 feet; discharge, 747 second-feet.

Daily gage height, in feet, of Siletz River at Siletz, Oreg., for the year ending Sept. 30, 1911.

[John Kentta, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.6	1.3	3.8	3.1	2.7	3.0	2.2	1.7	1.9	1.6	1.0	0.8
2	5.4	1.3	4.0	2.9	2.7	2.9	2.1	1.9	1.9	1.6	.95	.8
3	4.1	1.4	4.7	2.7	2.6	2.9	2.1	2.1	1.8	1.6	.95	.8
4	3.7	1.4	4.5	2.6	3.0	2.8	2.05	3.6	1.7	1.5	.9	.8
5	3.1	1.4	4.3	2.4	5.3	2.8	2.0	3.2	1.7	1.5	.9	.85
6	2.5	1.5	4.1	2.4	4.6	2.8	2.0	3.0	1.6	1.5	.9	.9
7	2.1	7.8	4.0	2.3	4.2	2.7	2.0	2.7	1.6	1.4	.9	.9
8	2.1	4.0	4.3	2.2	3.6	2.7	2.0	2.8	1.5	1.4	.9	.9
9	1.8	3.2	4.5	2.8	3.2	2.7	1.9	3.0	1.5	1.4	.9	.9
10	1.9	16.1	4.0	2.6	3.0	2.6	2.2	2.8	1.5	1.4	.85	.95
11	1.9	8.0	3.6	2.7	2.9	2.9	2.2	2.6	1.4	1.3	.85	.95
12	2.1	4.6	3.2	2.5	2.8	2.8	2.2	2.7	1.4	1.3	.85	.95
13	1.9	3.6	2.8	2.4	2.8	2.8	2.1	2.6	1.4	1.3	.85	.95
14	1.8	3.1	2.6	2.3	3.2	2.7	2.1	2.5	1.4	1.2	.85	.95
15	1.7	2.7	2.4	2.2	3.1	2.7	2.1	2.4	1.3	1.2	.85	1.5
16	1.6	2.5	2.9	2.1	3.0	2.7	2.1	2.3	1.3	1.2	.8	1.55
17	1.6	2.3	2.5	2.9	2.9	2.6	2.1	2.5	1.3	1.2	.8	1.5
18	2.4	2.5	3.1	15.3	2.9	2.6	2.2	6.6	1.3	1.2	.8	1.5
19	2.2	4.2	3.2	14.0	2.8	2.6	2.2	6.2	1.3	1.15	.8	1.4
20	2.0	8.5	3.0	12.0	2.8	2.5	2.1	4.6	1.3	1.15	.9	1.4
21	1.8	16.5	3.3	4.9	2.7	2.5	2.1	3.5	1.25	1.1	.9	1.3
22	1.8	8.4	3.1	4.1	2.9	2.5	2.0	3.1	1.25	1.1	.9	1.3
23	1.6	7.2	2.9	3.4	3.1	2.5	2.0	2.8	1.25	1.1	.9	1.2
24	1.6	5.6	3.1	3.1	3.0	2.4	2.0	2.6	1.2	1.1	.85	1.2
25	1.6	4.5	3.8	3.0	2.9	2.4	1.9	2.4	1.2	1.1	.85	1.1
26	1.5	3.7	3.3	2.9	2.9	2.4	1.9	2.3	1.2	1.06	.85	1.0
27	1.4	3.1	3.0	2.9	3.2	2.4	1.9	2.25	1.5	1.05	.85	1.0
28	1.4	2.7	2.8	2.9	3.1	2.35	1.8	2.2	1.8	1.05	.8	1.0
29	1.4	4.0	2.9	2.8	....	2.35	1.8	2.1	1.7	1.0	.8	.95
30	1.3	3.5	3.2	2.8	....	2.3	1.8	2.05	1.6	1.0	.8	.95
31	1.3	....	3.3	2.7	....	2.3	....	2.0	....	1.0	.8	....

Daily discharge, in second-feet, of Siletz River at Siletz, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1,750	350	3,370	2,400	1,880	2,270	1,260	690	910	590	190	112
2	5,610	350	3,650	2,140	1,880	2,140	1,140	910	910	590	169	112
3	3,790	420	4,630	1,880	1,750	2,140	1,140	1,140	800	590	169	112
4	8,230	420	4,350	1,750	2,270	2,010	1,080	3,090	690	500	148	112
5	2,400	420	4,070	1,500	5,470	2,010	1,020	2,530	690	500	148	130
6	1,620	500	3,790	1,500	4,490	2,010	1,020	2,270	590	500	148	148
7	1,140	8,970	3,650	1,380	3,930	1,880	1,020	1,880	590	420	148	148
8	1,140	3,650	4,070	1,260	3,090	1,880	1,020	2,010	500	420	148	148
9	800	2,530	4,350	2,010	2,530	1,880	910	2,270	500	420	148	148
10	910	21,000	3,650	1,750	2,270	1,750	1,260	2,010	500	420	130	169
11	910	9,250	3,090	1,880	2,140	2,140	1,260	1,750	420	350	130	169
12	1,140	4,490	2,530	1,620	2,010	2,010	1,260	1,880	420	350	130	169
13	910	3,090	2,010	1,500	2,010	2,010	1,140	1,750	420	350	130	169
14	800	2,400	1,750	1,380	2,530	1,880	1,140	1,620	420	290	130	169
15	690	1,880	1,500	1,260	2,400	1,880	1,140	1,500	350	290	130	500
16	590	1,620	2,140	1,140	2,270	1,880	1,140	1,380	350	290	112	545
17	590	1,380	1,620	2,140	2,140	1,750	1,140	1,620	350	290	112	500
18	1,500	1,620	2,400	19,800	2,140	1,750	1,260	7,290	350	290	112	500
19	1,260	3,930	2,530	18,000	2,010	1,750	1,260	6,730	350	262	112	420
20	1,020	9,980	2,270	15,000	2,010	1,620	1,140	4,490	350	262	148	420
21	800	21,600	2,670	4,190	1,880	1,620	1,140	2,950	320	235	148	350
22	800	9,830	2,400	3,790	2,140	1,620	1,020	2,400	320	235	148	350
23	590	8,130	2,140	2,810	2,400	1,620	1,020	2,010	320	235	148	290
24	590	5,890	2,400	2,400	2,270	1,500	1,020	1,750	290	235	130	290
25	590	4,350	3,370	2,270	2,140	1,500	910	1,500	290	235	130	235
26	500	3,230	2,670	2,140	2,140	1,500	910	1,380	290	212	130	190
27	420	2,400	2,270	2,140	2,530	1,500	910	1,320	500	212	130	190
28	420	1,880	2,010	2,140	2,400	1,440	800	1,260	800	212	112	190
29	420	3,650	2,140	2,010	....	1,440	800	1,140	690	190	112	169
30	350	2,950	2,530	2,010	....	1,380	800	1,080	590	190	112	169
31	350	....	2,670	1,880	....	1,380	....	1,020	....	190	112	....

NOTE.—Discharge determined from a rating curve that is well defined between 250 and 4,000 second-feet and fairly well outside those limits.

Monthly discharge of Siletz River at Siletz, Oreg., for the year ending Sept. 30, 1911.

[Drainage area, 220 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	5,610	350	1,210	5.50	6.34	74,400	A.
November	21,600	350	4,740	21.5	23.99	282,000	B.
December	4,630	1,500	2,860	13.0	14.99	176,000	A.
January	19,800	1,140	3,540	16.1	18.56	218,000	B.
February	5,470	1,750	2,470	11.2	11.66	137,000	A.
March	2,270	1,380	1,780	8.09	9.33	109,000	A.
April	1,260	800	1,070	4.86	5.42	63,700	A.
May	7,290	690	2,150	9.77	11.26	132,000	A.
June	910	290	496	2.25	2.51	29,500	A.
July	590	190	334	1.52	1.75	20,500	B.
August	190	112	136	.618	.71	8,360	C.
September	545	112	244	1.11	1.24	14,500	B.
The year	21,600	112	1,750	7.95	107.76	1,260,000	

COLUMBIA RIVER BASIN.

COLUMBIA RIVER AT THE DALLES, OREG.

Location.—In sec. 34, T. 2 N., R. 13 E., 2,000 feet below the ferry at The Dalles about 18 miles below Deschutes River, and above Hood and Klickitat rivers.

Records available.—1892–1911, with a few breaks. Gage readings at Cascade Locks, 20 miles below The Dalles, used to extend record back to 1879.

Drainage area.—237,000 square miles.

Gage.—Two gages at The Dalles: The Government, or Brooks, gage, used by the United States Geological Survey, made up of several sections attached to the piling of the viaduct connecting Regulator Dock with the warehouse; the United States Army Engineers' gage, similar in form but with a datum 8.9 feet lower than the Brooks gage. Gage at Cascade Locks is attached to the side of wooden fender of upper locks chamber between upper guard and locks gates. Elevation of gage datum at Cascade Locks, 42.5 feet above sea level, except December 1, 1896, to December 31, 1899, when datum was 60 feet lower. Elevation of datum of Brooks gage, 45.6 feet.

Channel.—Rocky and permanent at the rapids at Cascade Locks—the control for all three gages.

Discharge measurements.—In 1903 made by United States engineers with rod floats and meter from a steamer. In 1907 by United States Geological Survey engineers with meter from a launch. In 1908 flood measurements by United States Geological Survey engineers 2,000 feet below the gage at The Dalles.

Accuracy.—Results good.

Cooperation.—Station has been maintained in cooperation with the United States Weather Bureau and the United States Engineer Corps.

No discharge measurements were made during the year.

Daily gage height, in feet, of Columbia River at The Dalles, Oreg., for the year ending Sept. 30, 1911.

[U. S. Weather Bureau, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.3	5.5	6.9	3.3	1.4	0.0	7.6	13.4	21.9	30.9	16.2	7.4
2	2.5	5.3	6.8	3.0	2.0	− .1	8.0	13.4	22.2	30.7	16.2	7.4
3	2.7	5.3	7.1	8.0	2.6	− .1	8.8	13.4	23.4	30.5	15.6	7.1
4	3.0	5.0	7.3	2.9	3.8	− .1	9.7	13.6	25.5	30.1	15.1	6.8
5	3.0	4.8	7.1	2.7	5.1	− .1	10.3	14.7	26.6	29.5	14.7	6.8
6	3.2	4.8	7.1	2.5	5.5	.0	10.3	15.5	27.5	29.0	14.4	6.8
7	4.1	4.8	7.6	2.6	4.5	.2	10.0	16.4	27.9	28.6	14.0	6.6
8	4.3	4.8	7.7	2.4	3.6	.5	9.5	17.9	27.7	28.3	13.7	6.7
9	4.5	4.7	7.6	2.4	3.0	1.5	8.9	18.6	27.7	27.8	13.3	7.1
10	4.3	5.0	6.9	2.4	2.6	2.7	8.5	18.8	28.7	27.2	13.0	7.3
11	4.3	5.8	6.5	2.4	2.7	4.2	8.2	18.7	29.2	26.5	12.8	7.2
12	4.4	6.1	6.3	2.4	2.2	4.8	8.2	18.5	29.4	25.7	12.4	7.2
13	4.4	6.5	5.9	2.2	2.1	4.7	8.5	18.4	29.8	24.7	12.2	7.0
14	4.4	6.9	5.9	1.8	2.1	4.5	8.5	18.2	31.1	24.2	11.9	6.6
15	4.3	6.9	5.7	1.4	1.8	4.3	8.0	18.3	32.3	23.5	11.3	6.5
16	4.3	6.5	5.5	1.2	1.5	4.4	7.8	18.5	33.3	22.9	11.0	6.3
17	4.6	6.3	5.4	.9	1.4	4.5	7.6	18.7	33.5	22.2	10.8	6.1
18	4.6	6.0	5.4	1.8	1.3	4.6	7.5	19.5	33.5	21.7	10.4	5.8
19	4.4	5.8	4.6	2.4	1.1	4.8	7.4	21.3	33.4	21.1	10.2	5.8
20	4.7	5.6	4.4	3.1	.9	5.4	7.3	22.1	33.4	20.7	10.0	5.9
21	5.0	6.3	4.6	2.5	.7	5.9	7.3	22.9	33.1	19.9	9.4	5.8
22	5.6	6.2	4.2	2.0	.7	6.2	7.5	23.1	33.1	19.6	9.0	5.7
23	5.6	6.5	3.8	1.6	.7	7.0	7.3	23.5	33.1	19.3	8.8	5.3
24	5.5	8.0	3.7	1.5	.6	7.5	7.7	22.8	32.8	18.7	8.6	5.1
25	5.4	8.6	3.9	1.4	.7	8.3	8.7	23.1	32.4	18.4	8.5	4.9
26	5.3	8.4	3.8	1.3	.6	8.5	9.3	23.1	32.4	18.2	8.4	4.9
27	5.0	8.0	3.7	1.0	.3	8.9	10.7	23.1	32.3	17.7	8.3	4.6
28	5.2	7.6	3.4	1.1	.0	8.9	11.8	22.8	31.4	17.0	8.2	4.5
29	5.6	7.3	3.5	1.1	......	8.8	12.7	22.5	30.6	16.5	8.0	4.4
30	6.0	7.2	3.5	1.1	......	8.0	13.2	22.1	30.9	16.4	7.8	4.0
31	5.8	......	3.5	1.2	......	7.5	......	21.6	......	16.4	7.5	......

NOTE.—January 15, ice running; January 16 to 18, river blocked with ice.

Daily discharge, in second-feet, of Columbia River at the Dalles, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	81,100	113,000	129,000	90,100	73,800	63,400	137,000	215,000	347,000	520,000	255,000	135,000
2	82,900	111,000	128,000	87,400	78,600	62,700	142,000	215,000	352,000	516,000	255,000	135,000
3	84,700	111,000	131,000	87,400	83,800	62,700	152,000	215,000	374,000	511,000	246.000	131,000
4	87,400	107,000	134,000	86,500	95,000	62,700	164,000	218,000	412,000	503,000	239,000	128,000
5	87,400	105,000	131,000	84,700	108,000	62,700	172,000	233,000	433,000	491,000	233,000	128,000
6	89,200	105,000	131,000	82,900	113,000	63,400	172,000	245,000	451,000	481,000	229.000	128,000
7	98,000	105,000	137,000	83,800	102,000	64,800	168,000	258,000	459,000	473,000	223.000	125,000
8	100,000	105,000	138,000	82,000	93,000	66,900	161,000	281,000	455,000	467,000	219,000	126,000
9	102,000	104,000	137,000	82,000	87,400	74,600	154,000	292,000	455,000	457.000	213.000	131,000
10	100,000	107,000	129,000	82,000	83,800	84,700	148,000	295,000	475,000	445,000	209,000	134,000
11	100,000	116,000	124,000	82,000	84,700	99,000	144,000	294,000	485,000	432,000	206,000	132,000
12	101,000	120,000	122,000	82,000	80,200	105,000	144,000	291,000	489,000	416,000	201,000	132,000
13	101,000	124,000	117,000	80,200	79,400	104,000	148.000	289,000	497,000	397,000	198,000	130,000
14	101,000	129,000	117,000	77,000	79,400	102,000	148,000	286,000	524,000	388,000	194,000	125,000
15	100,000	129,000	115,000	73,800	77,000	100,000	142,000	287,000	549,000	376,000	185,000	124,000
16	100,000	124,000	113,000	72,200	74,600	101,000	140,000	291,000	570,000	365,000	181,000	122,000
17	103,000	122,000	112,000	69,800	73,800	102,000	137,000	294,000	574,000	352,000	178,000	120,000
18	103,000	118,000	112,000	77,000	73,000	103,000	136,000	307,000	574,000	344,000	173,000	116,000
19	101,000	116,000	103,000	82,000	71,400	105,000	135,000	337,000	572,000	334,000	170,000	116,000
20	104,000	114,000	101,000	88,300	69,800	112,000	134,000	350,000	572,000	327,000	168,000	117,000
21	107,000	122,000	103,000	82,900	68,300	117,000	134,000	365,000	566,000	313,000	160,000	116,000
22	114,000	121,000	99,000	78,600	68,300	121,000	136,000	368,000	566,000	308,000	155,000	115,000
23	114,000	124,000	95,000	75,400	68,300	130,000	134,000	376,000	566,000	303.000	152,000	111,000
24	113,000	142,000	97,000	74,600	67,600	136,000	138,000	363,000	560,000	294,000	150,000	108,000
25	112,000	150,000	96,000	73,800	68,300	146,000	151,000	368,000	551,000	289,000	148,000	106,000
26	111,000	147,000	95,000	73,000	67,600	148,000	159,000	368,000	551,000	286,000	147,000	106,000
27	107,000	142,000	94,000	70,600	65,500	154,000	177,000	368,000	549,000	278,000	146,000	103,000
28	110,000	137,000	91,000	71,400	63,400	154,000	192,000	363,000	530,000	267,000	144,000	102,000
29	114,000	134,000	92,000	71,400	......	152,000	205,000	358,000	513,000	260,000	142,000	101,000
30	118,000	132,000	92,000	71,400	......	142,000	212,000	350,000	520,000	258,000	140,000	97,000
31	116,000	......	92,000	72,200	......	136,000	......	342,000	......	258,000	136,000	......

Monthly discharge of Columbia River at the Dalles, Oreg., for the year ending Sept. 30, 1911.

[Drainage area, 237,000 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth (in inches on drainage-area).	Total in acre-feet.	
October	118,000	81,100	102,000	0.430	0.50	6,270,000	A.
November	150,000	104,000	121,000	.511	.57	7,200,000	A.
December	138,000	91,000	113,000	.477	.55	6,950,000	A.
January	90,100	69,800	79,000	.333	.38	4,860,000	B.
February	113,000	63,400	79,200	.334	.35	4,400,000	B.
March	154,000	62,700	104,000	.439	.51	6,400,000	A.
April	212,000	134,000	154,000	.650	.73	9,160,000	A.
May	376,000	215,000	306,000	1.29	1.49	18,800,000	A.
June	574,000	347,000	503,000	2.12	2.36	29,900,000	A.
July	520,000	258,000	378,000	1.59	1.83	23,200,000	A.
August	255,000	136,000	187,000	.789	.91	11,500,000	A.
September	135,000	97,000	120,000	.506	.56	7,140,000	A.
The year	574,000	62,700	188,000	.793	10.74	136,000,000	

KOOTENAI RIVER AT LIBBY, MONT.

Location.—At the highway bridge opposite the Great Northern Railway depot at Libby, Mont., in sec. 3, T. 30 N., R. 31 W., about one-fourth mile from the town and post office.

Records available.—October 13, 1910, to September 30, 1911.

Drainage area.—11,000 square miles.

Gage.—Standard chain in the left span of the highway bridge. Previous to the completion of the bridge a temporary staff gage fastened to an old stump. In February, 1913, gage datum was lowered 2 feet; all readings previous to the change have been reduced to the new datum.

Channel.—Channel permanent; broken by two piers. Bed of stream composed of small rocks; current fairly swift and uniformly distributed.

Discharge measurements.—Made from the bridge and from the ferry cable prior to the erection of the bridge.

Winter flow.—Seriously affected by ice.

Diversions.—None of importance.

Accuracy.—Rating curve based on measurements made during 1910 to 1913; records considered excellent.

Cooperation.—Field data furnished by United States Forest Service.

Discharge measurements of Kootenai River at Libby, Mont., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*
Oct. 13	J. C. Beebe	4.88	11,300
1911.			
Mar. 15	F. W. Kramer	2.60	3,900
July 31	F. E. Bonner	6.00	18,900
Sept. 27	G. H. Lautz	3.86	7,830

NOTE.—Gage heights refer to the gage datum established in February, 1913.

Daily gage height, in feet, of Kootenai River at Libby, Mont., for the year ending Sept. 30, 1911.

[L. R. Bock, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1		3.9	3.3	2.3		4.2	6.4	7.6	10.8	5.9	4.4
2		3.8	3.3	2.4		4.4	6.5	9.6	10.6	5.7	4.4
3		3.7	3.4	2.4		4.3	6.6	11.4	10.6	5.6	4.3
4		3.7	3.3	2.3		4.0	6.9	12.4	10.7	5.5	4.4
5		3.6	3.4	2.3		3.9	7.3	12.1	10.6	5.4	4.3
6		3.6	3.4	2.5		3.9	8.0	11.5	9.8	5.4	4.5
7		3.5	3.2			3.6	8.1	11.1	9.8	5.4	4.4
8		3.8	3.2		2.6	3.6	8.2	10.9	9.8	5.6	4.5
9		4.1	3.2		2.6	3.6	7.9	10.7	9.7	6.3	4.3
10		4.1	3.1		2.5	3.6	7.6	10.4	9.7	6.1	4.4
11		4.7	3.1	2.7		3.7	7.2	11.1	9.6	6.0	4.2
12		4.6	3.0			3.7	7.9	11.0	9.0	5.8	4.1
13	4.8	4.6	2.9			3.6	6.8	12.2	8.8	5.6	4.0
14	4.7	4.7				3.6	6.9	12.6	8.0	5.4	3.9
15	4.6	4.7			2.6	3.5	7.0	13.2	7.6	5.3	3.8
16	4.4	4.1			2.7	3.5	7.0	13.8	7.6	5.2	3.9
17	4.4	3.8			2.8	3.6	7.8	13.6	7.6	5.0	3.8
18	4.5	3.8			2.8	3.7	8.5	13.0	7.7	5.1	3.9
19	4.5	4.0			3.0	3.8	8.5	12.8	7.7	4.9	3.9
20	4.4	4.1			3.2	4.0	8.0	12.2	7.7	4.8	3.9
21	4.3	4.2			3.2	4.4	7.9	11.7	7.7	4.5	3.8
22	4.2	4.4			3.6	5.0	7.7	11.4	6.8	4.5	3.9
23	4.5	4.3			3.8	5.9	7.8	11.7	6.9	4.4	3.9
24	4.0	4.2			3.8	6.2	7.4	12.1	6.8	4.4	3.8
25	4.0	3.9			4.0	6.4	6.9	12.0	6.5	4.4	3.8
26	4.3	3.8			3.9	7.2	7.1	11.8	6.4	4.4	3.8
27	4.4	3.7			3.8	7.3	6.9	11.8	6.2	4.4	3.8
28	4.3	3.5			3.6	7.1	6.6	11.8	6.1	4.3	3.7
29	4.3	3.5			3.6	6.7	6.4	11.6	6.2	4.6	3.7
30	4.0	3.4			3.6	6.3	6.6	10.8	6.0	4.5	3.6
31	3.9				3.9		6.7		6.0	4.3	

NOTE.—Gage heights Oct. 13 to Dec. 13, 1910, refer to a datum 2 feet lower than that of heights published in Water-Supply Paper 292, p. 119. Relation of gage height to discharge affected by ice Dec. 14, 1910, to Mar. 7, 1911.

Daily discharge, in second-feet, of Kootenai River at Libby, Mont., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1		7,560	5,670		8,570	17,800	24,100	45,900	15,400	9,280
2		7,230	5,670		9,280	18,200	36,800	44,300	14,600	9,280
3		6,910	5,970		8,920	18,700	50,800	44,300	14,100	8,920
4		6,910	5,670		7,890	20,300	59,500	45,100	13,700	9,280
5		6,590	5,970		7,560	22,400	56,900	44,300	13,300	8,920
6		6,590	5,970		7,560	26,400	51,700	38,200	13,300	9,650
7		6,280	5,370		6,590	27,000	48,300	38,200	13,300	9,280
8		7,230	5,370	3,780	6,590	27,600	46,700	38,200	14,100	9,650
9		8,230	5,370	3,780	6,590	25,800	45,100	37,500	17,300	8,920
10		8,230	5,080	3,550	6,590	24,100	42,700	37,500	16,400	9,280
11		10,400	5,080	3,600	6,910	21,900	48,300	36,800	15,900	8,570
12		10,000	4,800	3,650	6,910	25,800	47,500	32,700	15,000	8,230
13	10,800	10,000	4,530	3,700	6,590	19,800	57,800	31,400	14,100	7,890
14	10,400	10,400		3,740	6,590	20,300	61,300	26,400	13,300	7,560
15	10,000	10,400		3,780	6,280	20,800	66,800	24,100	12,800	7,230
16	9,280	8,230		4,020	6,280	20,800	72,500	24,100	12,400	7,560
17	9,280	7,230		4,270	6,590	25,200	70,600	24,100	11,600	7,230
18	9,650	7,230		4,270	6,910	29,500	65,000	24,700	12,000	7,560
19	9,650	7,890		4,800	7,230	29,500	63,200	24,700	11,200	7,560
20	9,280	8,230		5,370	7,890	26,400	57,800	24,700	10,800	7,560
21	8,920	8,570		5,370	9,280	25,800	53,400	24,700	9,650	7,230
22	8,570	9,280		6,590	11,600	24,700	50,800	19,800	9,650	7,560
23	9,650	8,920		7,230	15,400	25,200	53,400	20,300	9,280	7,560
24	7,890	8,570		7,230	16,800	23,000	56,900	19,800	9,280	7,230
25	7,890	7,560		7,890	17,800	20,300	56,000	18,200	9,280	7,230
26	8,920	7,230		7,560	21,900	21,300	54,300	17,800	9,280	7,230
27	9,280	6,910		7,230	22,400	20,300	54,300	16,800	9,280	7,230
28	8,920	6,280		6,590	21,300	18,700	54,300	16,400	8,920	6,910
29	8,920	6,280		6,590	19,200	17,800	52,500	16,800	10,000	6,910
30	7,890	5,970		6,590	17,300	18,700	45,900	15,900	9,650	6,590
31	7,560			7,560		19,200		15,900	8,920	

NOTE.—Discharge determined from a rating curve based on measurements made during 1910 to 1913; curve well defined between 3,400 and 25,000 second-feet and fairly well defined above 25,000 second-feet.

Monthly discharge of Kootenai River at Libby, Mont., for the year ending Sept. 30, 1911.

[Drainage area, 11,000 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October 13-31	10,800	7,560	9,090	0.826	0.58	343,000	A.
November	10,400	5,970	7,910	.719	.80	471,000	A.
December 1-13	5,970	4,530	5,420	.493	.24	140,000	A.
January							
February							
March 8-31	7,890	3,550	5,360	.487	.43	255,000	A.
April	22,400	6,280	10,600	.964	1.08	631,000	A.
May	29,500	17,800	22,700	2.06	2.38	1,400,000	B.
June	72,500	24,100	53,500	4.86	5.42	3,180,000	B.
July	45,900	15,900	28,700	2.61	3.01	1,760,000	B.
August	17,300	8,920	12,200	1.11	1.28	750,000	A.
September	9,650	6,590	8,040	.731	.82	478,000	A.

CALLAHAN CREEK AT TROY, MONT.

Location.—At the highway bridge in sec. 13, T. 31 N., R. 34 W., one-fourth mile southeast of the town of Troy, Mont.

Records available.—June 11 to October 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff attached to the right abutment of bridge.

Channel.—Small rocks and gravel; may shift.

Discharge measurements.—Made by wading or from the bridge.

Winter flow.—Affected by ice; no records available.

Diversions.—None of importance.

Accuracy.—Records fair.

Cooperation.—Field data furnished by United States Forest Service.

Discharge measurements of Callahan Creek at Troy, Mont., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 12[a]	E. W. Kramer		57	Sept. 27	G. H. Lautz	1.65	32
June 11	F. E. Bonner	3.15	618	Oct. 11	J. C. Beebe	1.73	24
Aug. 1	do	1.67	34				

[a] Ice present in stream. No gage installed.

Daily gage height, in feet, and discharge, in second-feet, of Callahan Creek at Troy, Mont., for the period June 11 to Oct. 31, 1911.

[Charles S. Dennis, observer.]

Day.	June.		July.		August.		September.		October.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	......	......	......	174	1.70	35	1.50	16	1.65	30
2	......	......	......	158	......	35	......	17	......	28
3	......	......	......	142	......	35	......	17	......	27
4	......	......	2.10	127	1.70	35	......	18	......	26
5	......	......	......	118	......	35	......	18	......	25
6	......	......	......	109		35	......	19	1.60	24
7	......	......	2.00	100	......	35	......	19	......	27
8	......	......	......	100	1.70	35	......	20	......	30
9	......	......	......	100	......	35	......	21	......	33
10	......	......	2.00	100	......	35	......	21	......	36
11	3.15	676	......	92	1.70	35	......	22	1.73	40
12	......	645	......	84	......	35	......	22	......	37
13	......	614	1.90	75	......	35	......	23	......	34
14	......	582	......	71	......	35	......	23	......	32
15	3.00	550	......	67	1.70	35	......	24	......	30
16		526	......	62	......	32		24	......	28
17	......	503	......	57	......	28	......	25	......	26
18	2.90	480	1.80	53	1.60	24	......	25	......	24
19	......	445	......	53	......	24	......	26	......	22
20	......	409	......	53	......	24	......	26	1.55	20
21	......	373	1.80	53	......	24	......	27	......	19
22	2.65	337	......	49	1.60	24	......	27	......	18
23	......	337	......	44	......	24	......	28	......	17
24	2.65	337	......	40	......	24	......	28	......	16
25	......	324	1.70	35	1.60	24	......	29	......	15
26	2.60	312		35		22	......	29	......	14
27	2.40	226	......	35	......	20	1.65	30	1.45	13
28	......	214	1.70	35	......	18	......	30	......	13
29	......	202	......	35	1.50	16	......	30	......	12
30	2.30	190	......	35	......	16	......	30	......	12
31	......	......	......	35	......	16	......	......	......	12

NOTE.—Discharge determined from a fairly well defined rating curve. Discharge interpolated for days for which gage heights are missing.

Monthly discharge of Callahan Creek at Troy,, Mont. for the period June 11 to Oct. 31, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
June 11-30	676	190	414.0	16,400	B.
July	174	35	75.0	4,610	B.
August	35	16	28.5	1,750	B.
September	30	16	23.8	1,420	C.
October	40	12	23.9	1,470	C.
The period	......	......	......	25,600	

YAAK CREEK NEAR TROY, MONT.

Location.—Near the south line of sec. 33, T. 34 N., R. 33 W., half a mile above Yaak Falls and bridge, about 7 miles above the mouth, and 17 miles north of Troy.

Records available.—October 15, 1910, to October 31, 1911.

Drainage area.—930 square miles.

Gage.—Vertical staff fastened to a tree on right bank.

Channel.—Large rock; very rough and practically permanent.

Discharge measurements.—Made by wading or from a cable 40 feet above the gage.

Winter flow.—Affected by ice; gage readings discontinued during winter season.

Diversions.—None.

Accuracy.—Rating curve well defined for low stages; gage heights too few to permit the making of monthly estimates.

Cooperation.—Field data furnished by United States Forest Service.

Discharge measurements of Yaak River near Troy, Mont., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 15	J. C. Beebe	0.88	232	Aug. 2	F. E. Bonner	1.15	345
				Sept. 28	G. H. Loutz	.95	258
1911.				Oct. 12	J. C. Beebe	.76	241
Mar. 14[a]	E. W. Kramer	1.02	349				

[a] Gage height affected by presence of ice.

Daily gage height, in feet, of Yaak River near Troy, Mont., for the period Oct. 1, 1910, to Oct. 31, 1911.

[C. S. Dennis, observer.]

Day.	Oct.	Nov.	Dec.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1		0.66							0.89	
2								1.15		
3										0.96
4			1.05	2.05						
5				2.03			2.20			
6		.98								
7										.94
8									1.05	
9								1.80		
10										
11										
12										.76
13		1.65								
14									.95	
15	0.88	2.45								
16								1.80		
17				3.05						
18										
19		1.15	1.30		3.90					.71
20										
21								.90		
22	.64	3.00		3.10				.90		
23						2.45				
24							1.00			
25										
26			1.15							.70
27		2.00			2.95					
28									.95	
29				3.00						
30					3.40					
31										

Daily discharge, in second-feet, of Yaak River near Troy, Mont., for the period Oct. 1, 1910, to Oct. 31, 1911.

Day.	Oct.	Nov.	Dec.	July.	Aug.	Sept.	Oct.
1		189				241	
2					346		
3							266
4			301				
5							
6		273					
7							258
8						301	
9					798		
10							
11							
12							208
13		669					
14						262	
15	238						
16					798		
17							
18							
19		346	424				197
20							
21					244		
22	186				244		
23							
24				280			
25							
26			346				195
27		1,000					
28						262	
29							
30							
31							

Note.—Discharge determined from a rating curve based on measurements made during 1910 to 1912 and which is well defined between 200 and 400 second-feet.

MOYIE RIVER AT SNYDER, IDAHO.

Location.—At the Spokane International Railway bridge in the SE. ¼ sec. 26, T. 64 N., R. 2 E., about 1 mile south of Snyder railroad station and ranger station, and about 11 miles above mouth of river.

Records available.—March 10 to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on right abutment.

Channel.—No information.

Discharge measurements.—Made from railroad bridge; bridge crosses stream at an angle.

Accuracy.—Results probably good.

Cooperation.—Field data furnished by United States Forest Service.

Discharge measurements of Moyie River at Snyder, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 10	E. W. Kramer	3.24	230	July 30	F. E. Bonner	3.60	413
June 15	F. E. Bonner	6.50	4,360	Sept. 16	G. H. Lautz	3.25	313

Daily gage height, in feet, of Moyie River at Snyder, Idaho, for the year ending Sept. 30, 1911.

[W. A. Schell, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	4.10	5.9	5.4	5.2	3.40	3.10
2	....	4.15	5.8	7.0	5.2	3.40	3.10
3	....	3.95	5.9	7.2	5.0	3.40	3.10
4	....	3.87	6.0	7.3	4.95	3.38	3.10
5	....	3.85	6.6	7.1	4.90	3.40	3.10
6	....	4.00	7.2	7.0	4.85	3.40	3.10
7	....	4.35	7.7	6.8	4.65	3.40	3.10
8	....	3.90	7.6	6.5	4.60	3.40	3.10
9	....	3.90	7.5	6.4	4.50	3.40	3.10
10	3.25	3.55	7.4	6.5	4.50	3.40	3.10
11	3.25	3.95	7.1	6.6	4.40	3.40	3.10
12	3.25	4.50	6.8	7.0	4.35	3.40	3.10
13	3.25	4.45	6.5	7.2	4.25	3.40	3.10
14	3.45	4.50	6.1	6.9	4.20	3.40	3.10
15	3.55	4.50	6.2	6.6	4.10	3.40	3.10
16	3.70	4.45	6.3	6.5	4.10	3.40	3.10
17	3.82	4.50	6.8	6.5	4.00	3.40	3.10
18	3.97	4.60	6.7	6.8	3.90	3.35	3.10
19	4.10	4.70	6.6	6.5	3.82	3.32	3.10
20	4.15	4.85	6.6	6.4	3.80	3.30	3.10
21	4.30	5.2	6.5	6.2	3.74	3.30	3.20
22	4.35	5.5	6.4	6.0	3.70	3.20	3.20
23	4.45	5.6	6.4	5.9	3.68	3.20	3.20
24	4.50	5.8	6.2	5.7	3.62	3.20	3.20
25	4.40	6.3	6.1	5.6	3.60	3.20	3.20
26	4.35	6.5	5.7	5.6	3.65	3.20	3.20
27	4.30	6.4	5.6	5.4	3.50	3.20	3.20
28	4.30	6.3	5.4	5.3	3.48	3.10	3.20
29	4.25	6.2	5.4	5.2	3.42	3.10	3.20
30	4.15	5.8	5.2	5.1	3.40	3.10	3.20
31	4.15	....	5.2	....	3.40	3.10	....

Daily discharge, in second-feet, of Moyie River at Snyder, Idaho, for the year ending Sept. 30, 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	736	2,930	2,170	1,910	288	161
2	....	778	2,770	4,950	1,910	288	161
3	....	621	2,930	5,370	1,660	288	161
4	....	565	3,100	5,580	1,600	279	161
5	....	551	4,160	5,160	1,540	288	161
6	....	656	5,370	4,950	1,480	288	161
7	....	960	6,450	4,550	1,260	288	161
8	....	586	6,230	3,970	1,210	288	161
9	....	586	6,010	3,790	1,110	288	161
10	221	364	5,790	3,970	1,110	288	161
11	221	621	5,160	4,160	1,010	288	161
12	221	1,110	4,550	4,950	960	288	161
13	221	1,060	3,970	5,370	865	288	161
14	312	1,110	3,270	4,750	820	288	161
15	364	1,110	3,440	4,160	736	288	161
16	451	1,060	3,610	3,970	736	288	161
17	530	1,110	4,550	3,970	656	288	161
18	635	1,210	4,350	4,550	586	265	161
19	736	1,320	4,160	3,970	530	251	161
20	778	1,480	4,160	3,790	516	242	161
21	910	1,910	3,970	3,440	477	242	200
22	960	2,310	3,790	3,100	451	200	200
23	1,060	2,460	3,790	2,930	439	200	200
24	1,110	2,770	3,440	2,610	403	200	200
25	1,010	3,610	3,270	2,460	391	200	200
26	960	3,970	2,610	2,460	421	200	200
27	910	3,790	2,460	2,170	337	200	200
28	910	3,610	2,170	2,040	327	161	200
29	865	3,440	2,170	1,910	298	161	200
30	778	2,770	1,910	1,780	288	161	200
31	778	....	1,910	....	288	161	....

NOTE.—Discharge determined from a fairly well defined rating curve.

Monthly discharge of Moyie River at Snyder, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
March 10-31	1,110	221	679	29,600	B.
April	3,970	364	1,610	95,800	B.
May	6,450	1,910	3,820	235,000	B.
June	5,580	1,780	3,770	224,000	B.
July	1,910	288	849	52,200	B.
August	288	161	249	15,300	B.
September	200	161	174	10,400	B.
The period				662,000	

CLARK FORK AT ST. REGIS, MONT.

Location.—At McLeod's ferry at St. Regis, Mont., in sec. 19, T. 18 N., R. 27 W., about half a mile below the mouth of St. Regis River.

Records available.—October 26, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff gage in two sections on the left bank.

Channel.—Practically permanent; current swift.

Discharge measurements.—Made from ferry cable.

Winter flow.—Not affected by ice except in short periods during extremely cold weather.

Diversions.—Water diverted from several of the tributaries to irrigate lands in the vicinity of Missoula and in the Bitterroot Valley.

Accuracy.—Results probably good.

Discharge measurements of Clark Fork at St. Regis, Mont., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 26	Raymond Richards	4.90	3,880	July 17	J. C. Beebe	6.30	7,160
				25	F. E. Bonner	5.60	5,800
1911.				Aug. 8	W. A. Lamb	5.32	4,830
July 14	J. C. Beebe	6.79	8,290	Sept. 20	G. H. Lautz	4.65	4,160

Daily gage height, in feet, of Clark Fork at St. Regis, Mont., for the year ending Sept. 30, 1911.

[Archie McLeod, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	4.85	5.2	4.20	4.40	3.70	6.9	9.3	9.2	9.9	5.1	4.40
2	....	4.85	5.2	4.20	4.5	3.65	7.3	9.2	10.5	10.0	5.0	4.30
3	....	4.8	5.15	4.15	4.40	3.65	7.2	9.1	11.5	9.9	5.1	4.20
4	....	4.8	5.2	4.10	4.30	3.70	7.1	9.6	12.2	9.7	5.2	4.30
5	....	4.85	5.25	4.10	4.25	3.70	7.0	10.0	12.5	9.4	5.2	4.30
6	....	4.8	5.3	4.20	4.20	3.80	6.7	10.7	12.6	8.9	5.3	4.40
7	....	4.75	5.2	4.40	4.20	3.90	6.5	11.0	12.4	7.9	5.4	4.5
8	....	5.0	5.05	4.30	4.05	4.00	6.4	11.4	12.5	8.6	5.3	4.5
9	....	5.05	5.0	4.35	4.10	4.10	6.3	10.9	13.2	8.4	5.3	4.6
10	....	5.25	4.95	4.40	4.10	4.20	6.3	10.5	13.1	8.2	5.2	4.8
11	....	5.7	4.9	4.35	4.05	4.40	6.2	10.1	12.7	7.9	5.2	4.7
12	....	5.9	4.8	4.20	4.10	4.5	6.2	9.8	13.0	7.4	5.1	4.6
13	....	6.1	4.6	4.20	4.10	4.6	6.2	9.7	13.5	7.0	5.1	4.7
14	....	6.1	4.5	4.10	4.10	4.8	6.1	9.7	13.9	6.7	5.0	4.8
15	....	6.0	4.35	4.10	4.15	4.9	6.0	9.7	13.8	6.7	4.9	4.7
16	....	5.9	4.25	4.05	4.20	5.2	....	9.9	13.5	6.6	4.8	4.6
17	....	6.0	4.2	4.20	4.15	5.3	6.1	10.4	13.0	6.3	4.8	4.6
18	....	5.5	4.15	4.20	4.10	5.5	6.1	10.4	12.4	6.3	4.7	4.6
19	....	5.2	4.1	4.40	4.00	5.7	6.2	10.4	12.0	6.2	4.6	4.6
20	....	5.3	4.15	4.5	3.90	5.9	6.3	10.0	11.8	6.1	4.5	4.7
21	....	5.5	4.2	4.6	3.80	6.1	6.4	9.7	11.6	5.9	4.40	4.7
22	....	5.8	4.25	4.30	3.70	6.2	6.6	9.4	11.2	5.8	4.40	4.7
23	....	5.8	4.35	4.05	3.70	6.4	7.4	9.3	11.2	5.7	4.35	4.7
24	....	5.75	4.65	4.20	3.75	6.7	8.0	9.2	11.2	5.6	4.30	4.6
25	....	5.6	4.6	4.20	3.70	7.0	8.6	9.2	11.0	5.5	4.20	4.6
26	4.9	5.5	4.65	4.30	3.70	6.7	8.9	9.1	10.7	5.4	4.20	4.7
27	4.95	5.4	4.6	4.20	3.60	6.5	9.3	9.1	10.3	5.4	4.30	4.6
28	5.0	5.25	4.5	4.10	3.70	6.2	9.7	9.0	9.9	5.3	4.20	4.6
29	5.05	5.2	4.4	4.10	....	6.0	9.5	8.9	10.0	5.2	4.30	4.5
30	5.0	5.15	4.3	4.20	....	6.2	9.4	8.8	9.9	5.1	4.30	4.6
31	4.95	....	4.2	4.30	....	6.5	....	8.9	....	5.1	4.40	....

Daily discharge, in second-feet, of Clark Fork at St. Regis, Mont., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	4,140	4,790	3,120	3,410	2,500	8,560	15,400	15,000	17,400	4,600	3,410
2	....	4,140	4,790	3,120	3,560	2,450	9,560	15,000	19,500	17,700	4,410	3,260
3	....	4,050	4,700	3,060	3,410	2,450	9,300	14,700	23,400	17,400	4,600	3,120
4	....	4,050	4,790	2,990	3,260	2,500	9,050	16,300	26,300	16,700	4,790	3,260
5	....	4,140	4,890	2,990	3,190	2,500	8,800	17,700	27,600	15,700	4,790	3,260
6	....	4,050	4,990	3,120	3,120	2,620	8,080	20,200	28,000	14,100	4,990	3,410
7	....	3,960	4,790	3,410	3,120	2,740	7,610	21,400	27,200	11,200	5,190	3,560
8	....	4,410	4,500	3,260	2,920	2,860	7,380	23,000	27,600	13,200	4,990	3,560
9	....	4,500	4,410	3,340	2,990	2,990	7,150	21,000	30,700	12,600	4,990	3,720
10	....	4,890	4,320	3,410	2,990	3,120	7,150	19,500	30,200	12,000	4,790	4,050
11	....	5,820	4,230	3,340	2,920	3,410	6,920	18,000	28,500	11,200	4,790	3,880
12	....	6,260	4,050	3,120	2,990	3,560	6,920	17,000	29,800	9,820	4,600	3,720
13	....	6,700	3,720	3,120	2,990	3,720	6,920	16,700	32,000	8,800	4,600	3,880
14	....	6,700	3,560	2,990	2,990	4,050	6,700	16,700	33,800	8,080	4,410	4,050
15	....	6,480	3,340	2,990	3,060	4,230	6,480	16,700	33,400	8,080	4,230	3,880
16	....	6,260	3,190	2,920	3,120	4,790	6,590	17,400	32,000	7,840	4,050	3,720
17	....	6,480	3,120	3,120	3,060	4,990	6,700	19,100	29,800	7,150	4,050	3,720
18	....	5,400	3,060	3,120	2,990	5,400	6,700	19,100	27,200	7,150	3,880	3,720
19	....	4,790	2,990	3,410	2,860	5,820	6,920	19,100	25,500	6,920	3,720	3,720
20	....	4,990	3,060	3,560	2,740	6,260	7,150	17,700	24,700	6,700	3,560	3,880
21	....	5,400	3,120	3,720	2,620	6,700	7,380	16,700	23,800	6,260	3,410	3,880
22	....	6,040	3,190	3,260	2,500	6,920	7,840	15,700	22,200	6,040	3,410	3,880
23	....	6,040	3,340	2,920	2,500	7,380	9,820	15,400	22,200	5,820	3,340	3,880
24	....	5,930	3,800	3,120	2,560	8,080	11,400	15,000	22,200	5,610	3,260	3,720
25	....	5,610	3,720	3,120	2,500	8,800	13,200	15,000	21,400	5,400	3,120	3,720
26	4,230	5,400	3,800	3,260	2,500	8,080	14,100	14,700	20,200	5,190	3,120	3,880
27	4,320	5,190	3,720	3,120	2,390	7,610	15,400	14,700	18,800	5,190	3,260	3,720
28	4,410	4,890	3,560	2,990	2,500	6,920	16,700	14,400	17,400	4,990	3,120	3,720
29	4,500	4,790	3,410	2,990	....	6,480	16,000	14,100	17,700	4,790	3,260	3,560
30	4,410	4,700	3,260	3,120	....	6,920	15,700	13,800	17,400	4,600	3,260	3,720
31	4,320	....	3,120	3,260	....	7,610	....	14,100	....	4,600	3,410	....

NOTE.—Discharge for 1910 and 1911 determined from a rating curve based on measurements made during 1910 to 1913; curve well defined above 6,500 second-feet and fairly well defined between 3,000 and 6,500 second-feet. Discharge interpolated for days on which gage was not read during 1911.

Monthly discharge of Clark Fork at St. Regis, Mont., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October 26-31	4,500	4,230	4,360	51,900	B.
November	6,700	3,960	5,210	310,000	B.
December	4,990	2,990	3,850	237,000	B.
January	3,720	2,920	3,170	195,000	B.
February	3,560	2,390	2,920	162,000	C.
March	8,800	2,450	4,980	306,000	B.
April	16,700	6,480	9,270	552,000	A.
May	23,000	13,800	16,900	1,040,000	A.
June	33,800	15,000	25,200	1,500,000	A.
July	17,700	4,600	9,300	572,000	A.
August	5,190	3,120	4,060	250,000	B.
September	4,050	3,120	3,680	219,000	B.
The period				5,390,000	

CLARK FORK NEAR PLAINS, MONT.

Location.—At Cooper's Ferry, in lot 7, sec. 7, T. 19 N., R. 26 W., about 3 miles above Plains, Mont., and about 7 miles below the mouth of Flathead River.

Records available.—October 28, 1910, to September 30, 1911.

Drainage area.—19,900 square miles.

Gage—An overhanging chain gage on the right bank, about 150 feet below the ferry cable.

Channel.—Practically permanent.

Discharge measurements.—Made from ferry cable.

Winter flow.—Stream freezes over at the gage for short periods during the winter, but is open at control section below gage. Relation between gage height and discharge little, if any, affected by ice.

Diversions.—A number of small ditches take water for irrigation from tributaries of Flathead River and headwaters of Clark Fork.

Accuracy.—Rating curve good, but gage-height record somewhat doubtful at times.

Discharge measurements of Clark Fork near Plains, Mont., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Nov. 10	Raymond Richards	5.51	10,300	July 9	B. E. Jones	10.86	46,500
				18	J. C. Beebe	9.09	31,700
1911.				26	F. E. Bonner	7.87	26,900
May 1	W. A. Lamb	8.75	29,000	Aug. 7	W. A. Lamb	6.87	17,800

Daily gage height, in feet, of Clark Fork near Plains, Mont., for the year ending Sept. 30, 1911.

[B. E. Monaghan and Hazel Biggs, observers.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	July.	Aug.	Sept.
1		5.2	6.1	5.0	4.4		5.7	8.8		7.0	5.0
2		5.2	6.1	5.0	4.2		5.6	8.6		7.0	5.0
3		5.2	6.0	5.0	4.3		5.7	8.8			5.2
4		5.3	6.0	4.8	4.2		5.6	9.0		7.0	5.2
5		5.2	6.0	4.8	4.2	4.4	5.6	9.6		7.3	5.4
6		5.3	5.9	4.9	4.2	4.4	5.7	9.7		7.0	5.4
7		5.3	5.8	4.8	4.2	4.2	5.6			6.8	5.4
8		5.4	5.8	4.8	4.0	4.2	5.8				5.2
9		5.4	5.8	4.9	4.1	4.1			10.9		5.4
10		5.5	5.7	4.8	4.0	4.2					5.4
11		5.7	5.7	4.8	4.1	4.3				7.0	5.4
12		5.9	5.7	4.8	4.0	4.2				6.8	5.4
13		6.1	5.6	4.8	4.1	4.4				6.6	5.4
14		6.1	5.6	4.8	4.0	4.4				6.8	5.2
15		6.2	5.5	4.8	4.2	4.4				6.9	5.3
16		6.2	5.4	4.8	4.2	4.8				6.2	5.2
17		6.2	5.3	4.6	4.2	4.6					5.2
18		6.2	5.3	4.6	4.2	4.6			9.0		5.4
19		6.2	5.2	4.8	4.2	4.8			9.0		5.2
20		6.2	5.2	4.8	4.2	4.8			8.8		5.2
21		6.2	5.2	4.8	4.2	5.0			8.6		5.2
22		6.3	5.1	4.8	4.2	5.0			8.4		5.2
23		6.3	5.1	4.9	4.3	5.2			8.2		5.2
24		6.4	5.2	4.8	4.2	5.2			8.2		5.2
25		6.4	5.2	4.8	4.2	5.4			8.1		5.2
26		6.4	5.2	4.7	4.3	5.4			7.8		5.2
27		6.4	5.1	4.6	4.2	5.4			7.6		5.2
28	5.2	6.3	5.1	4.6	4.4	5.4			7.6		5.2
29	5.3	6.2	5.1	4.5		5.6			7.4		5.2
30	5.2	6.2	5.1	4.4		5.6			7.2	5.2	5.1
31	5.2		5.1	4.4		5.6			7.0	5.2	

NOTE.—No observer available Apr. 9–30 and May 7–July 17. Readings July 18 to Aug. 16 somewhat doubtful, as it was found later that observer was not reading correctly.

Daily discharge, in second-feet, of Clark Fork near Plains, Mont., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	July.	Aug.	Sept.
1		9,400	13,100	8,720	6,970	6,970	11,300	29,700		18,000	8,720
2		9,400	13,100	8,720	6,470	6,970	10,900	28,200		18,000	8,720
3		9,400	12,600	8,720	6,710	6,970	11,300	29,700		18,000	9,400
4		9,760	12,600	8,100	6,470	6,970	10,900	31,200		18,000	9,400
5		9,400	12,600	8,100	6,470	6,970	10,900	35,800		19,700	10,100
6		9,760	12,200	8,400	6,470	6,970	11,300	36,600		18,000	10,100
7		9,760	11,700	8,100	6,470	6,470	10,900			16,800	10,100
8		10,100	11,700	8,100	6,020	6,470	11,700			17,100	9,400
9		10,100	11,700	8,400	6,240	6,240			46,600	17,400	10,100
10		10,500	11,300	8,100	6,020	6,470			44,800	17,700	10,100
11		11,300	11,300	8,100	6,240	6,710			43,100	18,000	10,100
12		12,200	11,300	8,100	6,020	6,470			41,400	16,800	10,100
13		13,100	10,900	8,100	6,240	6,970			39,700	15,700	10,100
14		13,100	10,900	8,100	6,020	6,970			38,000	16,800	9,400
15		13,600	10,500	8,100	6,470	6,970			36,300	17,400	9,760
16		13,600	10,100	8,100	6,470	8,100			34,600	13,600	9,400
17		13,600	9,760	7,530	6,470	7,530			32,900	13,300	9,400
18		13,600	9,760	7,530	6,470	7,530			31,200	13,300	10,100
19		13,600	9,400	8,100	6,470	8,100			31,200	12,700	9,400
20		13,600	9,400	8,100	6,470	8,100			29,700	12,400	9,400
21		13,600	9,400	8,100	6,470	8,720			28,200	12,100	9,400
22		14,100	9,060	8,100	6,470	8,720			26,800	11,800	9,400
23		14,100	9,060	8,400	6,710	9,400			25,400	11,500	9,400
24		14,700	9,400	8,100	6,470	9,400			25,400	11,200	9,400
25		14,700	9,400	8,100	6,740	10,100			24,700	10,900	9,400
26		14,700	9,400	7,810	6,710	10,100			22,700	10,600	9,400
27		14,700	9,060	7,530	6,740	10,100			21,500	10,300	9,400
28	9,400	14,100	9,060	7,530	6,970	10,100			21,500	10,000	9,400
29	9,760	13,600	9,060	7,250		10,900			20,300	9,700	9,400
30	9,400	13,600	9,060	6,970		10,900			19,200	9,400	9,060
31	9,400		9,060	6,970		10,900			18,000	9,400	

NOTE.—Daily discharge determined from a fairly well defined curve based on measurements made during 1910 to 1912. Discharge interpolated for some days for which gage heights are missing.

Monthly discharge of Clark Fork River near Plains, Mont., for the year ending Sept. 30, 1911.

[Drainage area, 19,900 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October 28-31	9,760	9,400	9,490	0.477	0.07	75,300	B.
November	14,700	9,400	12,400	.623	.70	738,000	B.
December	13,100	9,060	10,500	.528	.61	646,000	B.
January	8,720	6,970	8,010	.403	.46	493,000	B.
February	6,970	6,020	6,440	.324	.34	358,000	B.
March	10,900	6,240	8,070	.406	.47	496,000	B.
April 1-8	11,700	10,900	11,200	.563	.17	178,000	B.
May 1-6	36,600	28,200	31,900	1.60	.36	380,000	B.
June	....	....	....	....	....	....	
July 9-31	46,600	18,000	30,600	1.54	1.32	1,400,000	C.
August	19,700	9,400	14,400	.724	.83	885,000	C.
September	10,100	8,720	9,570	.481	.54	569,000	B.

RACETRACK CREEK NEAR ANACONDA, MONT.

Location.—In sec. 15, T. 6 N., R. 11 W., directly above the falls in Race Track Creek about 3 miles above the Race Track ranger station and 17 miles from Anaconda, near the head works of the State of Montana power flume.

Records available.—July 11 to October 31, 1911.

Drainage area.—38 square miles.

Gage.—Vertical staff fastened to a tree and ledge rock on left bank.

Channel.—Rock; probably permanent. Channel at gage divided by a large rock.

Discharge measurements.—Made by wading.

Winter flow.—Seriously affected by ice.

Diversion.—Water diverted above station for mining. A placer ditch takes out immediately below. The State of Montana is building a flume to carry water from a point near the gage for development of power to light the State buildings at Deer Lodge. Below the station nearly the entire flow is diverted from the stream for irrigation.

Accuracy.—Results poor. Gage heights affected by diversion of water from one channel to the other by means of ice or débris lodging across either channel.

Cooperation.—Field data furnished by the United States Forest Service.

Discharge measurements of Racetrack Creek near Anaconda, Mont., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
July 11	E. W. Kramer	3.98	116
Oct. 2	J. C. Beebe	3.19	33

Daily gage height, in feet, and discharge, in second-feet, of Racetrack Creek near Anaconda, Mont., for 1911.

[F. E. Hughes and Kirk P. Cecil, observers.]

Day.	July.		August.		September.		October.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1				54		38		35
2				54		38	3.19	36
3				55		37		36
4				55	3.20	37		35
5			3.42	55		37		35
6				54		37		35
7				52		37		34
8				51		37	3.15	34
9				50	3.20	37		34
10				48		36		33
11	3.98	108		47		35		32
12		102		46		34		32
13	3.88	97		44		34		31
14		94	3.27	43		33		31
15		90		43		32		30
16		87		44		32		30
17		84		44		31		29
18		80		45		30		28
19	3.68	77	3.30	45	3.10	30		28
20		74		45		30		27
21		72		44		30		27
22		69		43		30		26
23		66		42		30		26
24		64		41		30		25
25		61		41		30		24
26		58	3.24	40	3.10	30	3.00	24
27		56		40		31		24
28	3.40	53		40		32		24
29		53		39		33		24
30		53		39		34		24
31		54		39				24

NOTE.—Discharge determined from a fairly well defined rating curve based on measurements in 1911 and 1912. Discharge interpolated for days for which gage heights are missing.

Monthly discharge of Racetrack Creek near Anaconda, Mont., for 1911.

[Drainage area, 38 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
July 11-31	108	53	73.9	1.94	1.51	3,080	B.
August	55	39	45.9	1.21	1.40	2,820	B.
September	38	30	33.4	.879	.98	1,990	B.
October	36	24	29.6	.779	.90	1,820	B.

LITTLE BLACKFOOT RIVER NEAR ELLISTON, MONT.

Location.—In the SE. ¼ SW. ¼ sec. 30, T. 9 N., R. 6 W., about 500 feet below the Little Blackfoot ranger station in the Helena National Forest and about 5 miles southeast of Elliston, Mont.

Records available.—September 29, 1910, to Sept. 30, 1911.

Drainage area.—59 square miles.

Gage.—Vertical staff.

Channel.—Gravel and small rocks; probably permanent.

Discharge measurements.—Made by wading near gage.

Winter flow.—Seriously affected by ice.

Diversions.—Water for irrigation taken out about half a mile above the ranger station is carried past this point; the amount of water carried by this ditch is measured by a gage. (See p. 66.)

Accuracy.—Measurements insufficient for estimates of discharge.

Cooperation.—Field data furnished by the United States Forest Service.

The following discharge measurement was made by F. E. Bonner:

May 11, 1911: Gage height, 3.53 feet; discharge, 213 second-feet.

Daily gage height, in feet, of Little Blackfoot River near Elliston, Mont., for the year ending Sept. 30, 1911.

[M. D. Mizner, observer.]

Day.	Sept.	Oct.	Nov.	Dec.	Apr.	May.	June.	July.	Aug.	Sept.
1		1.08	1.30	1.60		2.80		2.10	1.70	
2		1.19	1.30	1.57		2.85	3.40	2.20	1.70	
3		1.19	1.30	1.55		3.00	3.70		1.70	
4		1.19	1.24	1.52			3.70		1.75	
5		1.19	1.00	1.50			3.70	2.30	1.75	
6		1.21	1.50	1.50		4.0		2.40		
7		1.21	1.50	1.49		4.4		2.80		
8		1.21	1.50	1.49		4.0		2.80		
9			1.50			3.80				
10			1.51			3.80				
11			1.51			3.80	3.70			
12			1.51			3.80				
13			1.51			3.80				
14			1.51			3.80				
15			1.51			3.70	3.70			
16			1.51		2.00	3.70	3.20			
17			1.51			3.70	3.00			1.20
18			1.51			3.70	2.80			1.20
19		1.20	1.51		2.20	3.50	2.60			1.20
20		1.20	1.52		2.20	3.20	2.50			1.20
21		1.15	1.52		2.00	3.00	2.20			1.20
22		1.15	1.52		2.30	3.10	2.10			1.20
23		1.29	1.53		2.60	3.30	2.10	2.00		1.20
24		1.29	1.54		2.85	3.20	2.10	2.00		1.21
25		1.29			2.90	3.10	2.10	2.00		1.21
26		1.29	1.60		2.95	3.10	2.10	2.00		1.21
27		1.30	1.60		3.00	3.10	2.10	2.00		1.21
28		1.30	1.60		3.10	3.10				
29	1.12	1.30	1.60		2.10	3.20				1.21
30	1.11	1.30	1.60		2.00	3.30	2.10	1.60		1.20
31		1.30						1.60		

LITTLE BLACKFOOT DITCH NEAR ELLISTON, MONT.

Location.—In the SE. ¼ SW. ¼ sec. 30, T. 9 N., R. 6 W., immediately below the highway bridge over the ditch near the Little Blackfoot ranger station in the Helena National Forest, about half a mile below the head gates, and 5 miles southeast of Elliston.

Records available.—September 29, 1910, to September 30, 1911.

Gage.—Vertical staff.

Channel.—Probably shifting.

Discharge measurements.—Made by wading.

Artificial control.—By head gates.

Accuracy.—Measurements inadequate for estimates of discharge.

Cooperation.—Maintained in cooperation with the United States Forest Service.

Daily gage height, in feet, of Little Blackfoot ditch near Elliston, Mont., for the year ending Sept. 30, 1911.

[M. D. Mizner, observer.]

Day.	Sept.	Oct.	Nov.	May.	June.	July.	Aug.	Sept.
1		1.47	1.30	0.68		1.00	1.60	
2		1.41	1.30	.70	0.40	.80	1.60	
3		1.41	1.30	.72	.70		1.65	
4		1.41	1.24		.70		1.65	
5		1.41	1.00		.60	.80	1.65	
6		1.41		.82		.80		
7		1.41				.80		
8		1.40				.80		
9								
10								
11					.70			
12								
13								
14								
15					.70			
16					.80			
17					1.00			1.20
18					1.00			1.20
19		1.35			1.00			1.20
20		1.35			1.00			1.20
21		1.30		.40	1.00			1.20
22		1.30		.42	.98			1.20
23		1.29		.44	1.00	1.20		1.20
24		1.29		.40	1.00	1.20		1.18
25		1.29		.30	1.00	1.20		1.18
26		1.29		.30	1.00	1.20		1.18
27		1.30		.30	1.00	1.20		1.18
28		1.30		.30				
29	1.41	1.30		.34				1.18
30	1.42	1.31		.36	1.00	1.55		1.18
31		1.31				1.60		

NOTE.—No flow between Nov. 5, 1910, and May 20, 1911. Flow continuous May 21, 1911, to Sept. 30, 1911.

ROCK CREEK NEAR QUIGLEY, MONT.

Location.—About 2 miles above Quigley, below the mouth of Ranch Creek, and about 12 miles from junction with Clark Fork.

Records available.—September 22, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Staff attached to a tree on right bank; datum unchanged.

Channel.—Practically permanent.

Discharge measurements.—Made from cable 75 feet below gage.

Winter flow.—Affected by ice.

Diversions.—None above station.

Accuracy.—Records probably good.

Cooperation.—Field data furnished by United States Forest Service.

Discharge measurements of Rock Creek near Quigley, Mont., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 4[a]	E. W. Kramer		188	May 31	E. W. Kramer	2.35	1,460
Feb. 21[a]	....do		171	June 28	....do	2.75	1,500

[a] Ice present in stream.

Daily gage height, in feet, of Rock Creek near Quigley, Mont., for the period Sept. 22, 1910, to Sept. 30, 1911.

(H. N. Morgan, observer.)

Day.	Sept.	Oct.	Nov.	Dec.	Apr.	May.	June.	July.	Aug.	Sept.
1				1.10	1.50	2.10	2.90			
2		1.10	1.20			2.10		2.60	1.70	1.10
3				1.10		2.30	3.60			
4						2.20	4.1			1.10
5		1.30	1.10		1.30		4.2		1.60	
6			1.10	1.10		2.80		2.50		
7		1.10					4.3		1.60	1.30
8					1.30	2.90	4.6			
9		1.10					4.4			1.20
10					1.30	2.60	4.2	2.40		
11									1.50	1.20
12			1.50			2.50	3.90			
13		1.20			1.30	2.50			1.50	
14										1.20
15			1.20		1.40	2.70		1.90		
16		1.10			1.30					1.20
17		1.10			1.30	3.10	3.60	1.70		1.20
18					1.40					
19		1.10	1.30		1.30		3.50		1.40	
20					1.40	2.80				
21		1.20								
22	1.30				1.50	2.70		1.70	1.20	
23										1.20
24					1.40		2.90	1.60		
25					1.70					
26			1.30		2.10	2.60	2.80		1.20	1.10
27		1.10								
28			1.30				2.75		1.10	
29					2.20			1.50		
30							2.80			1.10
31						2.55			.90	

Daily discharge, in second-feet, of Rock Creek near Quigley, Mont., for the period Sept. 22, 1910, to Sept. 30, 1911.

Day.	Sept.	Oct.	Nov.	Dec.	Apr.	May.	June.	July.	Aug.	Sept.
1		255	275	250	425	910	1,860	1,600	520	225
2		250	280	250	400	910	2,380	1,470	555	250
3		275	270	250	375	1,120	2,910	1,440	530	250
4		295	260	250	345	1,010	3,710	1,410	505	250
5		320	250	250	320	1,370	3,870	1,380	485	275
6		285	250	250	320	1,730	3,960	1,350	485	295
7		250	280		320	1,800	4,040	1,320	485	320
8		250	310		320	1,860	4,560	1,290	470	300
9		250	335		320	1,660	4,210	1,260	455	280
10		255	365		320	1,470	3,870	1,230	440	280
11		265	395		320	1,410	3,630	1,130	425	280
12		270	425		320	1,350	3,390	1,030	425	280
13		280	380		320	1,350	3,300	925	425	280
14		270	330		345	1,480	3,200	825	415	280
15		260	280		370	1,600	3,100	720	405	280
16		250	290		320	1,870	3,000	640	400	280
17		250	300		320	2,140	2,910	555	390	280
18		250	310		370	2,010	2,830	555	380	280
19		250	320		320	1,870	2,750	555	370	280
20		265	320		370	1,730	2,570	555	340	280
21		280	320		400	1,660	2,390	555	310	280
22	320	275	320		425	1,600	2,210	555	280	280
23	315	270	320		400	1,570	2,040	520	280	280
24	305	265	320		370	1,530	1,860	485	280	270
25	300	260	320		555	1,500	1,800	475	280	260
26	290	255	320		910	1,470	1,730	460	280	250
27	285	250	320		940	1,460	1,700	450	265	250
28	275	255	320		975	1,440	1,660	435	250	250
29	270	260	300		1,010	1,430	1,700	425	235	250
30	260	265	275		960	1,420	1,730	455	215	250
31		270				1,410		490	200	

NOTE.—Discharge for 1910 and 1911 determined from a fairly well defined rating curve based on measurements made during 1910 to 1912. Discharge interpolated for days for which gage heights are missing except Dec. 7 to 31, which was estimated at 200 second-feet.

Monthly discharge of Rock Creek near Quigley, Mont., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	320	250	265	16,300	B.
November	425	250	312	18,600	B.
December	250	....	210	12,900	D.
January	....	....	[a] 180	11,100	D.
February	....	....	[a] 170	9,400	D.
March	....	....	[a] 250	15,400	D.
April	1,010	320	460	27,400	B.
May	2,140	910	1,520	93,500	B.
June	4,560	1,660	2,830	168,000	B.
July	1,600	425	856	52,600	B.
August	555	200	380	23,400	B.
September	320	225	272	16,200	B.
The year	4,560	....	640	465,000	

[a] Estimated.

WEST FORK OF BITTERROOT RIVER NEAR DARBY, MONT.

Location.—In sec. 27, T. 2 N., R. 21 W., approximately 500 feet downstream from the Trapper Creek ranger station, half a mile below the mouth of Trapper Creek, and 10 miles south of Darby.

Records available.—September 19, 1910, to September 30, 1911.

Drainage area.—572 square miles.

Gage.—Standard chain.

Channel.—Small rock; uniform; probably permanent.

Discharge measurements.—Made by wading or from cable.

Winter flow.—Affected by ice.

Diversions.—None.

Accuracy.—Results fair.

Cooperation.—Field data furnished by United States Forest Service.

Discharge measurements of West Fork of Bitterroot River near Darby, Mont., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 10[a]	E. W. Kramer	....	127	July 20	F. E. Bonner	2.73	452
Apr. 17	J. P. Martin	2.65	414	Sept. 18	E. W. Kramer	2.00	164
June 15	C. F. Farmer	5.45	3,390				

[a] Ice present in stream.

Daily gage height, in feet, of West Fork of Bitterroot River near Darby, Mont., for the period Sept. 19, 1910, to Sept. 30, 1911.

[W. A. Kerlee, observer.]

Day.	Sept.	Oct.	Nov.	Dec.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1		2.00	2.22	2.30		3.05	3.75	5.1	4.15	2.40	
2		2.01	2.25	2.30			3.80	5.2	3.85	2.55	
3		2.22	2.30	2.34		3.30	4.0	5.4	3.75	2.50	2.10
4		2.51	2.23	2.35		3.20	4.2	5.6		2.60	2.10
5		2.05	2.18	2.36		3.05	4.8	5.3	3.65	2.45	2.15
6		2.48	2.10	2.16		2.95	5.1	5.1	3.65	2.45	2.20
7		2.40	2.20	2.20		2.90	4.7	5.4	3.60	2.50	2.20
8		2.38	2.40	2.37		2.95	4.6	5.6	3.50	2.45	2.20
9		2.38	2.60	2.30			4.3	5.3		2.40	2.15
10		2.35	2.65	2.32		3.00	4.2	5.1	3.20	2.30	
11		2.33	2.85	2.26		3.00	4.0	5.4	3.15		
12		2.31	2.95	2.22		2.85	4.0	5.7	3.15	2.35	
13				2.20		2.80	4.1	5.8	3.10	2.20	
14				2.20		2.75		5.7	3.10	2.20	
15				2.20		2.80	4.4	5.6	3.00	2.15	
16				2.25			4.6	5.3	2.95	2.20	
17				2.34		2.75		5.3	2.95	2.15	
18				2.34		2.85			2.95	2.15	2.10
19	2.11			2.34		2.90		5.1	2.85	2.15	
20	2.05			2.43	3.00	2.90		5.0	2.75		
21	2.10			2.50	2.95	3.05		4.7	2.80	2.15	
22	2.12			2.47	2.95	3.10		4.8	2.80	2.15	
23	2.09			2.47	3.15	3.30		4.7	2.70	2.10	
24	2.08			2.46	3.10	3.65		4.5	2.65	2.15	
25	2.08				2.95	4.0		4.1	2.55		
26	2.05				2.85	4.3		3.95			
27	2.05				2.75	4.3		3.90			
28	2.06			2.42	2.65	4.3		3.95			
29	2.01			2.39	2.65	4.0	4.0	3.90			
30	2.00			2.35	2.80		4.0	4.0			
31				2.35	3.10		4.5				

Daily discharge, in second-feet, of West Fork of Bitterroot River near Darby, Mont., for the period Sept. 19, 1910, to Sept. 30, 1911.

Day.	Sept.	Oct.	Nov.	Dec.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1		140	213	245		640	1,180	2,830	1,580	285	174
2		143	225	245		725	1,230	2,990	1,280	355	172
3		213	245	261		810	1,430	3,310	1,180	330	170
4		335	217	265		740	1,640	3,650	1,140	330	170
5		155	198	269		640	2,390	3,150	1,100	308	188
6		321	170	191		580	2,830	2,830	1,100	308	205
7		285	205	205		550	2,250	3,310	1,050	330	205
8		277	285	273		580	2,120	3,650	970	308	205
9		277	380	245		595	1,750	3,150	855	285	188
10		265	408	253		610	1,640	2,830	740	245	186
11		257	520	229		610	1,430	3,310	705	255	184
12		249	580	213		520	1,430	3,820	705	265	182
13		249	563	205		490	1,530	4,000	670	205	180
14		247	546	205		462	1,700	3,820	670	205	178
15		245	529	205		490	1,870	3,650	610	188	176
16		243	512	225		476	2,120	3,150	580	205	174
17		241	495	261		462	2,070	3,150	580	188	172
18		239	478	261		520	2,020	2,990	580	188	170
19	174	237	461	261		550	1,970	2,830	520	188	170
20	155	235	444	298	610	550	1,910	2,680	462	188	170
21	170	233	427	330	580	640	1,850	2,250	490	188	170
22	177	231	410	316	580	670	1,790	2,390	490	188	170
23	167	229	393	316	705	810	1,730	2,250	435	170	170
24	164	227	375	312	670	1,100	1,680	1,990	408	188	170
25	164	225	357	307	580	1,430	1,630	1,530	355	187	170
26	155	223	339	302	520	1,750	1,580	1,380	345	186	170
27	155	221	321	298	462	1,750	1,530	1,330	335	184	170
28	158	219	303	294	408	1,750	1,480	1,380	325	182	170
29	143	217	285	281	408	1,430	1,430	1,330	315	180	170
30	140	215	267	265	490	1,300	1,430	1,430	305	178	170
31		214		265	670		1,990		295	176	

NOTE.—Daily discharge determined from a fairly well defined rating curve based on measurements made during 1910 and 1911. Discharge interpolated for days for which gage heights are missing except Jan. 1 to Mar. 31.

Monthly discharge of West Fork of Bitterroot River near Darby, Mont., for the year ending Sept. 30, 1911.

[Drainage area, 572 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	335	140	236	0.413	0.48	14,500	C.
November	580	170	372	.650	.73	22,100	C.
December	330	191	261	.456	.53	16,000	B.
March 20-31	705	408	557	.972	.43	13,300	B.
April	1,750	462	808	1.41	1.57	48,100	B.
May	2,830	1,180	1,760	3.08	3.55	108,000	C.
June	4,000	1,330	2,750	4.81	5.37	164,000	B.
July	1,580	295	683	1.19	1.37	42,000	B.
August	355	176	231	.404	.47	14,200	B.
September	205	170	177	.309	.34	10,500	C.

EAST FORK OF BITTERROOT RIVER NEAR DARBY, MONT.

Location.—In the SE. ¼ sec. 21, T. 2 N., R. 20 W., at Joe Olsen's bridge in front of the Medicine Tree ranger station, 10 miles from Darby and 3 miles from the junction of the east and west forks.

Records available.—October 20, 1910, to September 30, 1911.

Drainage area.—340 square miles.

Gage.—Vertical staff on pier of bridge.

Channel.—Large rocks; irregular and probably permanent.

Discharge measurements.—Made by wading and from bridge.

Winter flow.—Affected by ice.

Diversions.—None of importance.

Accuracy.—Records good.

Cooperation.—Field data furnished by United States Forest Service.

Discharge measurements of East Fork of Bitterroot River near Darby, Mont., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 12[a]	E. W. Kramer	......	74	July 19	F. E. Bonner	3.00	253
Apr. 18	J. P. Martin	2.50	152	Sept. 19	E. W. Kramer	2.34	107
June 16	C. F. Farmer	6.20	1,720				

[a] Ice present in stream.

Daily gage height, in feet, of East Fork of Bitterroot River near Darby, Mont., for the year ending Sept. 30, 1911.

Day.	Sept.	Oct.	Nov.	Dec.	Apr.	May.	June.	July.	Aug.
1.			2.30			3.10	4.2		
2.		2.30	2.30			3.10	4.9		2.85
3.		2.40	2.35				5.2	4.5	
4.		2.60	2.30						2.80
5.		2.40	2.25				5.6	3.80	
6.		2.40	2.25						
7.		2.35	2.25	2.30	2.60		5.7	3.50	
8.		2.35	2.40	2.20	2.50	3.90	6.0		2.85
9.		2.30	2.40	2.30		3.90	5.8		2.70
10.		2.28	2.40	2.00		3.70		3.40	2.60
11.		2.25	2.50	2.00			5.8		
12.		2.25	2.60				6.1		
13.		2.30					6.2		
14.		2.35	2.30				6.1	3.20	
15.		2.30	2.30			4.1	6.2		
16.		2.25	2.10			4.2	6.2	3.10	
17.		2.20	2.10		2.50	4.2	5.3	3.20	
18.		2.30	2.10		2.50	4.1	5.1		
19.		2.30		2.40				3.00	2.25
20.	2.20	2.25	2.30			3.80			
21.		2.25	2.35			3.70		2.95	
22.		2.25	2.40	2.40	2.65	3.80		2.90	2.20
23.		2.25	2.40		2.75		4.5		
24.	2.30	2.25			3.45	4.0			
25.		2.25			3.50				
26.		2.35			3.20	3.90	4.1		
27.		2.30		2.45	3.40		4.0		
28.		2.20		2.50	3.40		4.1	2.80	
29.					3.20		4.1	2.75	
30.	2.20	2.25		2.50	3.20				2.20
31.		2.28		2.40					2.20

Daily discharge, in second-feet, of East Fork of Bitterroot River near Darby, Mont., for the year ending Sept. 30, 1911.

Day.	Sept.	Oct.	Nov.	Dec.	Apr.	May.	June.	July.	Aug.
1.		94	104	115		286	749	796	218
2.		104	104	113		286	1,080	843	224
3.		124	114	111		340	1,230	890	218
4.		166	104	109		394	1,330	726	212
5.		124	94	107		448	1,430	563	215
6.		124	94	105		502	1,460	496	218
7.		114	94	104	167	555	1,480	428	221
8.		114	124	84	145	609	1,630	414	224
9.		104	124	104	145	609	1,530	400	189
10.		100	124	50	145	517	1,530	386	167
11.		94	145	50	145	554	1,530	369	158
12.		94	166	59	145	591	1,680	350	150
13.		104	135	68	145	628	1,730	332	142
14.		114	104	77	145	665	1,680	315	134
15.		104	104	86	145	702	1,730	300	126
16.		94	66	95	145	749	1,730	286	118
17.		84	66	104	145	749	1,280	315	110
18.		104	66	114	145	702	1,180	288	102
19.		104	85	124	153	632	1,120	260	94
20.	84	94	104	124	161	563	1,060	254	91
21.	89	94	114	124	170	517	1,010	248	88
22.	94	94	124	124	178	563	948	236	85
23.	99	94	124	126	200	609	890	232	85
24.	104	94	123	128	407	655	827	228	85
25.	101	94	122	130	428	632	765	224	85
26.	98	114	121	132	315	609	702	220	85
27.	95	104	120	134	386	632	655	216	85
28.	92	84	119	145	386	655	702	212	85
29.	88	89	118	145	315	678	702	200	85
30.	84	94	117	145	315	702	749	206	85
31.		100		124		726		212	85

NOTE.—Discharge for 1910 determined from a fairly well defined curve and by interpolation for days on which gage was not read. Discharge for 1911 determined from a rating curve well defined between 70 and 350 second-feet and above 1,300 second-feet. Discharge interpolated for days for which gage heights are missing between Apr. 7 and Aug. 31.

Monthly discharge of East Fork of Bitterroot River near Darby, Mont., for the year ending Sept. 30, 1911.

[Drainage area 340 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	166	84	104	0.306	0.35	6,400	B.
November	166	66	111	.326	.36	6,600	B.
December	145	50	108	.318	.37	6,640	C.
April 7-30	428	145	216	.635	.57	10,300	A.
May	749	286	583	1.71	1.97	35,800	B.
June	1,730	655	1,200	3.53	3.94	71,400	B.
July	890	200	369	1.09	1.26	22,700	B.
August	224	85	138	.406	.47	8,480	B.

LOLO CREEK NEAR LOLO, MONT.

Location.—In sec. 34, T. 12 N., R. 21 W., at the highway bridge at Anderson's ranch, 7 miles upstream from the town of Lolo and from the junction of this creek with the Bitterroot.

Records available.—April 25 to September 30, 1911, for station at present site. October 18, 1910, to March 9, 1911, 1 mile below Anderson's ranch.

Drainage area.—249 square miles.

Gage.—Vertical staff fastened to bridge abutment.

Channel.—Rock; probably permanent.

Discharge measurements.—Made by wading or from the bridge.

Winter flow.—Affected by ice.

Diversions.—Water taken out above station for irrigation on small ranches; below station water is diverted for irrigation on the land adjoining this creek and Bitterroot River.

Accuracy.—Records good for present site. No rating curve developed for gage heights taken at site of first gage.

Cooperation.—Field data furnished by United States Forest Service.

Discharge measurements of Lolo Creek near Lolo, Mont., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 18	J. C. Beebe	2.21	90	July 5	E. W. Kramer	2.90	414
Dec. 30	E. W. Kramer	2.11	74	Sept 8	do	2.00	92

Gage height, in feet, of Lolo Creek, at old gage near Lolo, Mont., for the year ending Sept. 30, 1911.

Oct 18, 1910	2,20	Dec. 31, 1910	2.10
Oct. 29	2.13	Jan. 2, 1911	2.20
Oct. 31	2.22	Jan. 4	2.15
Nov. 1	2.25	Jan. 6	2.10
Nov. 3	2.20	Jan. 8	2.10
Nov. 5	2.15	Mar. 9	2.15
Dec. 30	2.10		

Daily gage height, in feet, and discharge, in second-feet, of Lolo Creek near Lolo, Mont., for the year ending Sept. 30, 1911.

[Archie Thayer, observer.]

Day.	April.		May.		June.		July.		August.		September.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	......	......	3.20	600	3.55	882	3.20	600	2.05	106	1.78	55
2	......	......	3.20	600	3.75	1,060	3.10	533	2.10	117	1.76	52
3	......	......	3.30	675	3.85	1,160	3.05	502	2.20	142	1.74	49
4	......	......	3.40	755	3.90	1,200	3.00	471	2.30	170	1.78	55
5	......	......	3.40	755	3.80	1,100	2.95	442	2.25	156	1.84	65
6	......	......	4.00	1,300	3.65	970	2.90	414	2.25	156	1.96	87
7	......	......	3.70	1,020	3.70	1,020	2.90	414	2.20	142	2.04	104
8	......	......	3.60	925	3.80	1,100	2.85	388	2.20	142	2.05	106
9	......	......	3.50	840	3.70	1,020	2.80	362	2.05	106	2.05	106
10	......	......	3.40	755	3.70	1,020	2.75	338	2.10	117	2.05	106
11	......	......	3.20	600	2.90	1,200	2.70	315	2.05	106	1.98	91
12	......	......	3.30	675	3.95	1,250	2.65	294	2.05	106	1.98	91
13	......	......	3.30	675	4.00	1,300	2.60	273	2.00	95	1.98	91
14	......	......	3.45	798	3.95	1,250	2.50	235	1.98	91	1.96	87
15	......	......	3.50	840	3.80	1,100	2.45	218	1.96	87	1.96	87
16	......	......	3.40	755	3.70	1,020	2.40	201	1.92	79	1.96	87
17	......	......	3.40	755	3.55	882	2.40	201	1.88	72	1.96	87
18	......	......	3.50	840	3.55	882	2.35	186	1.88	72	1.96	87
19	......	......	3.40	755	3.50	840	2.30	170	1.88	72	1.94	83
20	......	......	3.40	755	3.45	798	2.30	170	1.86	68	1.94	83
21	......	......	3.25	638	3.40	755	2.25	156	1.86	68	1.92	79
22	......	......	3.30	675	3.40	755	2.20	142	1.86	68	1.92	79
23	......	......	3.30	675	3.40	755	2.20	142	1.84	65	1.88	72
24	......	......	3.25	638	3.60	925	2.20	142	1.84	65	1.88	72
25	3.25	638	3.25	638	3.60	925	2.20	142	1.84	65	1.86	68
26	3.40	755	3.20	600	3.35	715	2.15	130	1.84	65	1.86	68
27	3.45	798	3.15	566	3.20	600	2.15	130	1.84	65	1.84	65
28	3.50	840	3.10	533	3.20	600	2.10	117	1.84	65	1.84	65
29	3.35	715	3.05	502	3.25	638	2.05	106	1.82	61	1.82	61
30	3.20	600	3.00	471	3.25	638	2.05	106	1.82	61	1.82	61
31	......	......	3.30	675	......	......	2.00	95	1.70	43	......	......

NOTE.—Gage heights read on the gage at Anderson's ranch established Apr. 25, 1911. Discharge determined from a rating curve based on measurements made during 1911 and 1912; curve well defined above 50 second-feet. Gage height June 11 apparently 1 foot too low; gage height 3.9 feet therefore used to obtain discharge.

Monthly discharge of Lolo Creek near Lolo, Mont., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April 25-30	840	600	724	8,620	A.
May	1,300	471	719	44,200	A.
June	1,300	600	945	56,200	A.
July	600	95	262	16,100	A.
August	170	43	93.3	5,740	A.
September	106	49	78.3	4,660	A.
The period	....	....	....	136,000	

ST. REGIS RIVER NEAR ST. REGIS, MONT.

Location.—At the St. Regis ranger station in the NE. ¼ sec. 28, T. 18 N., R. 28 W., approximately 3 miles from the town of St. Regis and the junction with Clark Fork.

Records available.—September 17, 1910, to September 30, 1911.

Drainage area.—278 square miles.

Gage.—Vertical staff on left bank 100 feet below a suspension bridge at the ranger station.

Channel.—Small rock; shallow and probably permanent.

Discharge measurements.—Made by wading, or from bridge.

Winter flow.—Affected by ice; gage readings are discontinued.

Diversion.—A small amount of water diverted from creek.

Accuracy.—Results good.

Cooperation.—Field data furnished by United States Forest Service.

Discharge measurements of St. Regis River near St. Regis, Mont., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 17	W. A. Lamb	1.85	121	June 9	E. W. Kramer	4.10	1,400
				July 16	J. C. Beebe	2.49	356
1911.				24	F. E. Bonner	2.30	265
Feb. 28*a*	J. P. Martin	2.0	129	Sept. 19	G. H. Lautz	1.95	182
Apr. 4	F. E. Bonner	4.23	1,520				

a Ice present in stream.

Daily gage height, in feet, of St. Regis River near St. Regis, Mont., for the period Sept. 17, 1910, to Sept. 30, 1911.

[S. Culpepper and L. H. Foote, observers.]

Day.	Sept.	Oct.	Nov.	Dec.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	1.80	1.85	2.50	......	4.6	4.6	4.6	3.10	2.15	1.85
2	......	1.84	1.85	......	......	4.6	4.8	5.0	3.00	2.22	1.85
3	......	2.30	2.12	......	......	4.4	4.9	4.9	3.00	2.22	1.85
4	......	2.80	2.38	......	......	4.2	5.1	4.6	2.95	2.20	1.95
5	......	2.45	1.92	......	......	4.0	5.4	4.4	2.90	2.25	2.00
6	......	2.30	1.90	......	......	3.7	5.6	4.2	2.80	2.25	1.95
7	......	2.21	2.40	......	......	3.6	5.2	4.5	2.80	2.25	1.92
8	......	2.16	3.25	......	......	3.45	4.8	4.2	2.75	2.20	1.90
9	......	2.70	2.65	......	......	3.6	4.6	4.1	2.70	2.15	1.90
10	......	1.96	2.90	......	......	3.7	4.4	4.2	2.65	2.20	1.90
11	......	2.02	3.25	2.50	......	3.6	4.3	4.3	2.60	2.15	1.92
12	......	2.00	3.60	2.25	......	3.5	4.2	4.4	2.60	2.10	1.95
13	......	1.98	2.25	2.00	......	3.40	4.2	4.4	2.60	2.05	1.95
14	......	1.95	1.92	1.90	......	3.30	4.2	4.3	2.55	2.00	1.95
15	......	1.95	1.65	1.90	......	3.30	4.3	4.2	2.50	2.00	1.95
16	......	1.95	1.90	1.70	......	3.40	4.6	4.0	2.50	2.00	1.95
17	1.85	......	2.25	1.80	......	3.6	4.7	3.8	2.50	2.00	1.95
18	1.85	......	2.25	1.70	......	3.8	4.6	3.7	2.45	2.00	1.95
19	1.80	......	3.25	......	3.20	3.7	4.5	3.6	2.42	2.00	1.95
20	1.80	......	3.12	......	3.6	3.9	4.4	3.5	2.40	2.00	1.95
21	1.85	......	3.00	......	3.8	4.4	4.3	3.5	2.40	2.00	1.95
22	1.86	......	3.40	......	3.9	4.8	4.2	3.40	2.40	2.00	1.95
23	1.81	1.80	3.00	......	4.1	5.1	4.1	3.45	2.35	2.05	1.90
24	1.80	1.80	2.90	......	3.8	5.4	4.2	3.40	2.32	1.90	1.90
25	1.81	1.80	2.60	......	3.6	5.6	4.2	3.40	2.30	1.90	1.90
26	1.81	2.00	2.90	......	3.5	5.4	4.0	3.20	2.28	1.90	1.90
27	1.80	2.38	3.00	......	3.35	5.2	4.0	3.20	2.25	1.90	1.90
28	1.80	2.50	3.00	......	3.20	5.0	......	3.20	2.22	1.90	1.90
29	1.80	2.25	3.00	......	3.6	4.8	......	3.20	2.20	1.90	1.90
30	1.80	2.10	2.75	......	4.0	4.6	......	3.10	2.18	1.85	1.90
31	......	2.00	......	......	4.4	......	4.2	......	2.15	1.85	......

Daily discharge, in second-feet, of St. Regis River near St. Regis, Mont., for the period Sept. 1, 1910, to Sept. 30, 1911.

Day.	Sept.	Oct.	Nov.	Dec.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	120	130	142	350	130	2,000	2,000	2,000	640	214	128
2	120	140	142	350	165	2,000	2,290	2,620	588	238	128
3	120	275	216	350	195	1,730	2,450	2,450	588	238	128
4	120	485	303	350	230	1,500	2,800	2,000	563	231	152
5	120	330	160	350	265	1,300	3,410	1,730	538	250	166
6	120	275	155	350	295	1,040	3,880	1,500	488	250	152
7	120	244	310	350	330	965	2,990	1,860	488	250	144
8	120	228	758	350	365	855	2,290	1,500	463	231	139
9	120	435	412	350	395	965	2,000	1,400	438	214	139
10	120	170	540	350	430	1,040	1,730	1,500	416	231	139
11	120	186	758	350	465	965	1,610	1,610	393	214	144
12	120	180	1,000	258	495	890	1,500	1,730	393	197	152
13	120	175	258	180	530	820	1,500	1,730	393	182	152
14	120	168	160	155	565	755	1,500	1,610	370	166	152
15	120	168	92	155	595	755	1,610	1,500	348	166	152
16	120	168	155	105	630	820	2,000	1,300	348	166	152
17	142	162	258	130	665	965	2,140	1,120	348	166	152
18	142	157	258	105	695	1,120	2,000	1,040	328	166	152
19	130	151	758	100	695	1,040	1,860	965	316	166	152
20	130	145	673	100	965	1,210	1,730	890	308	166	152
21	142	140	600	100	1,120	1,730	1,610	890	308	166	152
22	145	135	860	100	1,210	2,290	1,500	820	308	166	152
23	132	130	600	100	1,400	2,800	1,400	855	288	182	139
24	130	130	540	100	1,120	3,410	1,500	820	276	139	139
25	132	130	390	100	965	3,880	1,500	820	268	139	139
26	132	180	540	100	890	3,410	1,300	695	261	139	139
27	130	303	600	100	788	2,990	1,300	695	250	139	139
28	130	350	600	100	695	2,620	1,350	695	238	139	139
29	130	258	600	100	965	2,290	1,400	695	231	139	139
30	130	210	460	100	1,300	2,000	1,450	640	224	128	139
31	....	180	....	100	1,730	....	1,500	....	214	128	....

NOTE.—Discharge for 1910 determined from a fairly well defined rating curve. Discharge interpolated for days on which gage was not read. Discharge for 1911 determined from a rating curve well defined between 160 and 3,000 second-feet. Discharge Mar. 1 to 18 interpolated.

Monthly discharge of St. Regis River near St. Regis, Mont., for the year ending Sept. 30, 1911.

[Drainage area, 278 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	485	130	210	0.755	0.87	12,900	B.
November	1,000	92	443	1.59	1.77	26,400	B.
December	350	100	201	.723	.83	12,400	C.
March	1,730	130	687	2.47	2.85	42,200	D.
April	3,880	755	1,670	6.01	6.70	99,400	A.
May	3,880	1,300	1,910	6.87	7.92	117,000	A.
June	2,620	640	1,320	4.75	5.30	78,600	A.
July	640	214	375	1.35	1.56	23,100	A.
August	250	128	184	.662	.76	11,300	A.
September	166	128	145	.522	.58	8,630	A.

NORTH FORK OF FLATHEAD RIVER NEAR COLUMBIA FALLS, MONT.

Location.—In sec. 7, T. 31 N., R. 19 W., at Potter's ranch, three-fourths of a mile above junction with Middle Fork of Flathead River, and about 10 miles northeast of Columbia Falls.

Records available.—September 22, 1910, to September 30, 1911.

Drainage area.—1,620 square miles.

Gage.—Vertical staff on right bank near ranch buildings.

Channel.—Rocky; clean and practically permanent.

Discharge measurements.—Made from cable about three-fourths of a mile above gage.

Winter records.—Channel open at the control during winter, relation of gage height to discharge probably not seriously affected by ice.

Accuracy.—Rating curve good; results probably highly accurate except for short periods during the winter months.

Discharge measurements of North Fork of Flathead River near Columbia Falls, Mont., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Sept. 22	C. S. Heidel	1.60	965	Jan. 3[a]	B. E. Jones	1.00	508
Oct. 13	W. A. Lamb	2.94	2,540	June 30	W. A. Lamb	5.38	7,820
Nov. 26	B. E. Jones	2.51	1,900	Aug. 10	J. C. Beebe	2.90	2,530

[a] Partially frozen over at measuring section. Open at gage.

Daily gage height, in feet, of North Fork of Flathead River near Columbia Falls, Mont., for the period Sept. 22, 1910, to Sept. 30, 1911.

[J. F. Potter, observer.]

Day.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	2.0	2.45	2.2	1.3	1.7	1.4	2.2	4.4	5.6	5.4	2.8	1.9
2	....	2.35	2.4	2.15	1.0	1.65	1.5	2.3	4.4	6.6	5.2	2.8	1.9
3	....	2.65	2.3	2.15	1.1	1.6	1.6	2.2	4.5	7.1	5.0	2.8	2.0
4	....	2.9	2.25	2.15	1.55	1.6	1.6	2.2	4.8	7.0	4.9	2.7	2.0
5	....	2.6	2.2	2.05	1.8	1.7	1.55	2.1	5.3	6.6	4.8	2.6	2.2
6	....	2.5	2.1	2.05	1.8	1.7	1.55	2.0	6.0	6.2	4.6	2.6	2.5
7	....	2.8	2.15	2.0	1.8	1.75	1.55	1.95	6.0	6.2	4.6	2.7	2.4
8	....	3.6	2.5	2.0	1.65	1.7	1.55	2.0	5.7	6.2	4.5	2.9	2.3
9	....	3.5	2.4	2.0	1.45	1.7	1.55	2.1	5.4	6.2	4.4	2.9	2.2
10	....	3.45	2.5	1.85	1.35	1.7	1.55	2.2	5.2	6.2	4.2	2.9	2.2
11	....	3.3	3.65	1.7	1.45	1.6	1.5	2.3	5.0	6.6	4.1	2.8	2.2
12	....	3.1	4.15	1.7	1.1	1.6	1.5	2.2	4.8	6.9	4.0	2.7	2.2
13	....	2.9	3.8	1.8	1.3	1.6	1.45	2.2	5.0	7.2	3.9	2.6	2.2
14	....	2.75	3.5	1.7	1.6	1.6	1.4	2.1	5.0	7.2	3.8	2.6	2.2
15	....	2.6	3.2	1.65	1.65	1.6	1.35	2.1	5.0	7.2	3.7	2.5	2.2
16	....	2.5	3.05	1.65	1.9	1.6	1.2	2.2	5.2	7.0	3.7	2.5	2.2
17	....	2.5	2.9	1.8	2.0	1.5	1.2	2.4	5.8	6.8	3.7	2.4	2.2
18	....	2.5	2.85	1.7	2.1	1.5	1.2	2.7	5.8	6.7	3.6	2.4	2.2
19	....	2.4	2.7	1.6	1.95	1.4	1.25	2.7	5.6	6.6	3.6	2.3	2.1
20	....	2.35	2.7	1.8	1.9	1.4	1.4	3.1	5.3	6.4	3.4	2.3	2.1
21	....	2.25	2.9	1.6	1.9	1.4	1.55	3.5	5.2	6.2	3.4	2.3	2.2
22	1.6	2.2	3.0	1.6	1.8	1.35	1.75	4.0	5.2	6.2	3.3	2.3	2.3
23	1.6	2.15	2.85	1.7	1.85	1.3	1.9	4.4	5.2	6.2	3.2	2.2	2.4
24	1.7	2.1	2.7	1.7	1.9	1.3	2.0	4.6	5.0	6.3	3.2	2.1	2.3
25	1.7	2.5	2.6	1.7	1.9	1.5	2.0	5.0	4.8	6.5	3.1	2.1	2.2
26	1.6	3.25	2.5	1.7	1.9	1.55	1.9	5.2	4.6	6.2	3.0	2.1	2.2
27	1.6	3.0	2.4	1.65	1.9	1.35	1.95	5.3	4.4	5.8	3.0	2.0	2.2
28	1.55	2.8	2.3	1.6	1.9	1.4	1.9	5.0	4.2	5.8	3.0	2.0	2.2
29	1.6	2.7	2.3	1.6	1.9	....	1.95	4.7	4.1	5.6	2.9	2.0	2.1
30	1.7	2.65	2.25	1.6	1.8	....	2.0	4.4	4.2	5.4	2.8	2.0	2.1
31	....	2.55	....	1.6	1.8	....	2.2	....	4.6	....	2.9	1.9	....

Daily discharge, in second-feet, of North Fork of Flathead River near Columbia Falls, Mont., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1,300	1,820	1,510	710	1,050	790	1,560	5,370	8,480	7,920	2,330	1,240
2	1,690	1,750	1,460	510	1,000	870	1,670	5,370	11,300	7,380	2,330	1,240
3	2,090	1,630	1,460	570	960	960	1,560	5,600	12,800	6,850	2,330	1,340
4	2,470	1,570	1,460	915	960	960	1,560	6,330	12,500	6,590	2,180	1,340
5	2,020	1,510	1,350	1,140	1,050	915	1,450	7,650	11,300	6,330	2,040	1,560
6	1,880	1,400	1,350	1,140	1,050	915	1,340	9,600	10,200	5,840	2,040	1,910
7	2,310	1,460	1,300	1,140	1,100	915	1,290	9,600	10,200	5,840	2,180	1,790
8	3,890	1,880	1,300	1,000	1,050	915	1,340	8,760	10,200	5,600	2,480	1,670
9	3,650	1,750	1,300	830	1,050	915	1,450	7,920	10,200	5,370	2,480	1,560
10	3,540	1,880	1,160	750	1,050	915	1,560	7,380	10,200	4,920	2,480	1,560
11	3,210	4,020	1,030	830	960	870	1,670	6,850	11,300	4,710	2,330	1,560
12	2,820	5,400	1,030	570	960	870	1,560	6,330	12,200	4,500	2,180	1,560
13	2,470	4,400	1,110	710	960	830	1,560	6,850	13,100	4,290	2,040	1,560
14	2,240	3,650	1,030	960	960	790	1,450	6,850	13,100	4,090	2,040	1,560
15	2,020	3,010	990	1,000	960	750	1,450	6,850	13,100	3,890	1,910	1,560
16	1,880	2,730	990	1,240	960	640	1,560	7,380	12,500	3,890	1,910	1,560
17	1,880	2,470	1,110	1,340	870	640	1,790	9,040	11,900	3,890	1,790	1,560
18	1,880	2,390	1,030	1,450	870	640	2,180	9,040	11,600	3,690	1,790	1,560
19	1,750	2,170	950	1,290	790	675	2,180	8,480	11,300	3,690	1,670	1,450
20	1,690	2,170	1,110	1,240	790	790	2,800	7,650	10,700	3,320	1,670	1,450
21	1,570	2,470	950	1,240	790	915	3,500	7,380	10,200	3,320	1,670	1,560
22	1,510	2,640	950	1,140	750	1,100	4,500	7,380	10,200	3,140	1,670	1,670
23	1,460	2,390	1,030	1,190	710	1,240	5,370	7,380	10,200	2,970	1,560	1,790
24	1,400	2,160	1,030	1,240	710	1,340	5,840	6,850	10,400	2,970	1,450	1,670
25	1,880	2,020	1,030	1,240	870	1,340	6,850	6,330	11,000	2,800	1,450	1,560
26	3,110	1,880	1,030	1,240	915	1,240	7,380	5,840	10,200	2,640	1,450	1,560
27	2,640	1,750	990	1,240	750	1,290	7,650	5,370	9,040	2,640	1,340	1,560
28	2,310	1,630	950	1,240	790	1,240	6,850	4,920	9,040	2,640	1,340	1,560
29	2,160	1,630	950	1,240	....	1,290	6,080	4,710	8,480	2,480	1,340	1,450
30	2,090	1,570	950	1,140	....	1,340	5,370	4,920	7,920	2,330	1,340	1,450
31	1,950	....	950	1,140	....	1,560	....	5,840	....	2,480	1,240	....

NOTE.—Discharge for 1910 determined from a rating curve fairly well defined below 3,010 second-feet. Discharge for 1911 determined from a rating curve well defined below 10,000 second-feet.

Monthly discharge of North Fork of Flathead River near Columbia Falls, Mont., for the year ending Sept. 30, 1911.

[Drainage area, 1,620 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	3,890	1,300	2,220	1.37	1.58	136,000	B.
November	5,400	1,400	2,310	1.43	1.60	137,000	B.
December	1,510	950	1,120	.691	.80	68,900	B.
January	1,450	510	1,050	.648	.75	64,600	B.
February	1,100	710	917	.566	.59	50,900	B.
March	1,560	640	983	.607	.70	60,400	A.
April	7,650	1,290	3,080	1.90	2.12	183,000	A.
May	9,600	4,710	6,960	4.30	4.96	428,000	A.
June	13,100	7,920	10,800	6.67	7.44	643,000	A.
July	7,920	2,330	4,290	2.65	3.06	264,000	A.
August	2,480	1,240	1,870	1.15	1.33	115,000	A.
September	1,910	1,240	1,550	.957	1.07	92,200	A.
The year	13,100	510	3,090	1.91	26.00	2,240,000	

FLATHEAD RIVER AT DEMERSVILLE, NEAR KALISPELL, MONT.

Location.—Across the river from the steamboat landing at Demersville, 3 miles below Kalispell.

Records available.—April 24, 1909, to August 12, 1911.

Gage.—Vertical staff. Datum is 2,800 feet above sea level.

Discharge measurements.—No discharge measurements made, as station is maintained to determine relative height and slope of river.

Winter records.—River freezes entirely over; gage readings discontinued.

Daily gage height, in feet, of Flathead River at Demersville, near Kalispell, Mont., for the year ending Sept. 30, 1911.

[S. V. Shull, observer.]

Day.	Oct.	Nov.	Apr.	May.	June.	July.	Aug.
1	79.6	81.3	....	84.3	87.8	89.8	82.9
2	79.7	81.3	....	85.0	90.3	89.8	82.9
3	79.8	81.2	....	86.0	92.3	89.4	82.8
4	80.2	81.2	....	86.5	93.0	89.4	82.6
5	80.7	81.1	....	87.6	92.3	89.2	82.5
6	80.6	81.2	....	89.5	91.1	89.0	82.7
7	81.3	81.1	....	91.7	90.8	88.6	82.7
8	81.0	81.0	....	88.5	91.4	88.0	82.7
9	81.5	81.5	....	88.0	91.4	87.9	82.6
10	82.5	82.2	....	88.6	91.3	87.3	82.5
11	82.5	82.8	....	88.4	91.6	87.1	82.4
12	82.3	83.0	....	87.9	92.6	86.5	82.3
13	82.2	....	....	87.4	93.6	86.4	....
14	82.1	....	....	87.9	94.0	86.0	....
15	82.0	....	....	87.6	94.6	85.9	....
16	81.9	....	....	88.2	94.0	85.7	....
17	81.5	....	....	89.9	93.3	85.5	....
18	81.2	....	....	90.0	93.0	85.2	....
19	80.9	....	....	89.5	92.7	85.2	....
20	80.8	....	....	89.0	92.1	85.0	....
21	80.7	....	....	88.5	91.9	84.8	....
22	80.7	....	....	88.4	91.6	84.6	....
23	80.7	....	....	88.3	91.7	84.3	....
24	80.6	....	....	88.2	91.5	84.1	....
25	80.7	....	....	87.9	92.4	83.9	....
26	81.1	....	....	87.6	91.9	83.8	....
27	81.8	....	87.1	87.2	91.4	83.7	....
28	81.5	....	87.2	86.8	90.8	83.5	....
29	81.4	....	86.0	86.5	90.9	83.3	....
30	81.4	....	84.6	86.4	90.4	83.1	....
31	81.3	....	....	86.4	....	83.0	....

FLATHEAD RIVER AT DAMON'S RANCH, NEAR KALISPELL, MONT.

Location.—At Damon's ranch, 7 miles below Demersville and 10 miles below Kalispell.

Records available.—August 24, 1909, to August 12, 1911.

Gage.—Vertical staff. Datum is 2,800 feet above sea level.

Discharge measurements.—No discharge measurements made, as station is maintained to determine relative height and slope of river.

Winter records.—River freezes entirely over; gage readings discontinued.

Daily gage height, in feet, of Flathead River at Damon's ranch, near Kalispell, Mont., for the year ending Sept. 30, 1911.

[H. B. Louden, observer.]

Day.	Oct.	Nov.	May.	June.	July.	Aug.	Day.	Oct.	Nov.	May.	June.	July.	Aug.
1	79.6	80.9	84.2	86.5	88.8	82.9	16	80.55	......	86.8	91.1	85.4	......
2	79.6	80.85	84.2	88.0	88.6	82.8	17	80.6	......	87.6	90.8	85.2	......
3	79.85	80.8	84.8	89.0	88.4	82.7	18	80.6.	......	87.6	90.6	84.9	......
4	79.95	80.8	84.8	89.6	88.1	82.6	19	80.6	......	87.4	90.6	84.7	......
5	80.1	80.75	85.6	89.2	87.9	82.5	20	80.6	......	87.2	90.3	84.5	......
6	80.05	80.8	86.7	88.8	87.6	82.5	21	80.55	......	87.0	90.1	84.4	......
7	80.0	80.75	87.6	88.7	87.4	82.4	22	80.5	......	86.8	90.0	84.2	......
8	80.3	80.8	87.0	89.0	87.1	82.3	23	80.5	......	86.8	90.0	84.0	......
9	80.7	81.0	86.8	89.2	87.0	82.3	24	80.5	......	86.7	90.9	83.9	......
10	80.75	81.2	86.8	89.2	86.7	82.2	25	80.6	......	86.6	90.4	83.8	......
11	80.75	81.2	86.6	89.4	86.4	82.2	26	80.7	......	86.4	90.1	83.7	......
12	80.7	82.4	86.3	90.0	86.1	82.0	27	81.0	......	86.2	89.6	83.5	......
13	80.65	......	86.2	90.6	85.8	......	28	81.0	......	86.0	89.4	83.4	......
14	80.7	......	86.4	91.0	85.6	......	29	80.9	......	85.8	89.4	83.2	......
15	80.6	......	86.4	91.4	85.5	......	30	80.9	......	85.6	89.1	83.1	......
							31	80.9	......	85.7	......	83.0	......

FLATHEAD RIVER AT KELLER'S RANCH, NEAR HOLT, MONT.

Location.—At Keller's ranch, 1 mile above Holt, 16 miles below Kalispell, and 6 miles above Flathead Lake.

Records available.—April 24, 1909, to August 12, 1911.

Gage.—Vertical staff on right bank. Datum is 2,800 feet above sea level.

Discharge measurements.—No discharge measurements made, as station is maintained to determine relative height and slope of river.

Winter records.—River freezes entirely over; gage readings discontinued.

Daily gage height, in feet, of Flathead River at Keller's ranch, near Holt, Mont., for the year ending Sept. 30, 1911.

[Ben. Keller, observer.]

Day.	Oct.	Nov.	May.	June.	July.	Aug.	Day.	Oct.	Nov.	May.	June.	July.	Aug.
1	......	80.8	83.4	85.45	88.15	83.1	16	80.5	81.65	85.8	89.1	85.2	......
2	79.85	80.8	83.45	85.9	88.0	83.0	17	80.55	81.65	86.0	89.15	85.0	......
3	79.85	80.85	83.6	86.6	87.8	82.9	18	80.6	81.6	86.2	89.2	84.8	......
4	79.9	80.85	83.8	87.0	87.6	82.8	19	80.6	81.6	86.2	89.2	84.6	......
5	79.95	80.85	84.1	87.2	87.4	82.7	20	80.5	81.5	86.25	89.1	84.4	......
6	80.0	80.85	84.5	87.2	87.2	82.6	21	80.65	81.6	86.2	89.0	84.3	......
7	80.05	80.85	85.0	87.25	87.0	82.5	22	80.65	81.6	86.15	88.9	84.2	......
8	80.1	80.9	85.3	87.45	86.8	82.4	23	80.65	81.55	86.05	88.85	84.0	......
9	80.15	80.9	85.5	87.6	86.6	82.35	24	80.6	81.55	86.0	88.85	84.0	......
10	80.1	80.85	85.6	87.65	86.4	82.3	25	80.6	81.55	85.9	88.9	83.9	......
11	80.25	81.0	85.6	87.75	86.2	82.2	26	80.6	81.55	85.8	88.9	83.8	......
12	80.3	81.05	85.6	88.0	86.0	82.1	27	80.65	......	85.7	88.8	83.65	......
13	80.35	81.4	85.6	88.4	85.8	......	28	80.65	......	85.6	88.65	83.5	......
14	80.4	81.6	85.65	88.7	85.6	......	29	80.7	......	85.5	88.5	83.4	......
15	80.45	81.65	85.7	88.95	85.4	......	30	80.65	......	85.4	88.3	83.3	......
							31	80.8	......	85.35	......	83.2	......

FLATHEAD LAKE AT POLSON, MONT.

Location.—At the steamboat dock at Polson, at the southern extremity of the lake, about 35 miles north of Ravalli, and 35 miles south of Kalispell.

Records available.—August 23, 1908, to September 30, 1911.

Gage.—Vertical staff attached to a pile at the extreme end of the pier. Datum 2,800 feet above sea level.

Daily gage height, in feet, of Flathead Lake at Polson, Mont., for the year ending Sept. 30, 1911.

[J. M. Mettles, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	79.6	80.6	81.4	80.2	79.7	79.3	79.8	82.7	84.7	87.7	82.6	80.7
2	79.6	80.6	81.4	80.2	79.6	79.2	79.8	83.0	84.7	87.5	82.5	80.7
3	79.6	80.6	81.4	80.2	79.6	79.2	79.9	83.0	85.0	87.4	82.5	80.7
4	79.6	80.6	81.4	80.1	79.6	79.2	80.0	83.0	85.6	87.0	82.4	80.7
5	79.6	80.6	81.4	80.1	79.6	79.2	80.0	83.2	85.9	86.9	82.3	80.7
6	79.7	80.6	81.3	80.1	79.6	79.2	79.9	83.3	86.1	86.6	82.2	80.7
7	79.7	80.6	81.2	80.1	79.6	79.2	79.9	83.8	86.3	86.4	82.1	80.6
8	79.8	80.7	81.2	80.1	79.5	79.2	80.0	84.2	86.5	86.1	82.0	80.6
9	79.9	90.7	81.1	80.0	79.5	79.2	80.1	84.4	86.6	86.0	82.0	80.6
10	80.0	80.7	81.1	80.0	79.5	79.2	80.1	84.5	86.7	86.0	81.9	80.5
11	80.1	80.7	81.1	80.0	79.5	79.2	80.1	84.7	86.8	85.8	81.9	80.5
12	80.1	80.7	81.0	80.0	79.5	79.2	80.2	84.8	87.0	85.5	81.9	80.5
13	80.2	81.0	81.0	80.0	79.5	79.2	80.2	84.9	87.2	85.3	81.8	80.4
14	80.2	81.1	80.9	80.0	79.5	79.2	80.3	85.0	87.4	85.1	81.7	80.4
15	80.2	81.3	80.9	79.9	79.5	79.2	80.3	85.0	87.7	84.9	81.7	80.2
16	80.3	81.3	80.8	79.9	79.5	79.2	80.4	85.0	88.0	84.7	81.7	80.1
17	80.3	81.3	80.8	79.9	79.4	79.2	80.4	85.0	88.2	84.6	81.6	80.3
18	80.4	81.3	80.7	79.9	79.4	79.2	80.4	85.2	88.4	84.6	81.6	80.4
19	80.4	81.4	80.6	79.9	79.4	79.2	80.5	85.4	88.4	84.4	81.6	80.4
20	80.4	81.4	80.6	79.9	79.4	79.2	80.6	85.4	88.4	84.2	81.5	80.3
21	80.4	81.4	80.6	79.9	79.4	79.2	80.7	85.4	88.3	84.0	81.5	80.3
22	80.4	81.4	80.5	79.9	79.4	79.2	80.7	85.4	88.4	83.8	81.4	80.5
23	80.4	81.4	80.5	79.8	79.3	79.3	80.8	85.5	88.2	83.7	81.2	80.5
24	80.3	81.4	80.5	79.8	79.3	79.3	81.0	85.5	88.0	83.6	81.2	80.5
25	80.3	81.5	80.4	79.8	79.3	79.4	81.3	85.5	88.0	83.5	81.1	80.4
26	80.3	81.6	80.4	79.8	79.3	79.5	81.7	85.6	88.0	83.3	81.1	80.4
27	80.4	81.5	80.4	79.8	79.3	79.5	82.0	85.6	88.0	83.2	81.0	80.4
28	80.5	81.5	80.3	79.8	79.3	79.6	82.3	85.3	87.9	83.1	80.9	80.3
29	80.5	81.5	80.3	79.7	....	79.6	82.5	85.0	87.8	83.0	80.9	80.4
30	80.5	81.5	80.3	79.7	....	79.7	82.6	84.8	87.7	82.9	80.8	80.4
31	80.5	....	80.3	....	....	79.8	....	84.7	....	82.7	80.8	....

FLATHEAD RIVER NEAR POLSON, MONT.

Location.—At Mishell's ferry, 2½ miles below Newell Tunnel, 12 miles below Polson and 15 miles northwest of Ronan.

Records available.—July 23, 1907, to September 30, 1911.

Drainage area.—7,010 square miles.

Gage.—Chain gage on right bank 80 feet above the ferry.

Channel.—Small bowlders; practically permanent.

Discharge measurements.—Made from car on the ferry cable.

Winter flow.—Not seriously affected by ice.

Diversion.—Some small diversions from tributaries above Flathead Lake.

Accuracy.—Rating curve well defined. Accuracy of records is, however, somewhat affected by wind on Flathead Lake and also at the gage. Gage readings for certain periods during 1911 unreliable.

Discharge measurements of Flathead River near Polson, Mont., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*
Oct. 5	Raymond Richards	2.48	3,900
1911.			
Jan. 13[a]	B. E. Jones	2.97	3,990
Mar. 25[b]	.....do	2.30	3,230
July 6	.....do	10.44	34,500

[a] River full of floating slush ice; gage height probably not affected.
[b] Strong wind raised water at gage.

Daily gage height, in feet, of Flathead River near Polson, Mont., for the year ending Sept. 30, 1911.

[P. Mishell, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.37	3.85	5.10	3.5	2.6	2.1	2.6	6.7	8.9	11.4	6.6	4.2
2	2.37	3.90	5.10	3.4	2.6	2.1	2.7	6.9	9.0	11.1	6.4	4.2
3	2.40	3.90	5.10	3.0	2.6	2.0	2.8	6.9	9.0	11.0	6.3	4.2
4	2.42	3.90	5.10	3.0	2.6	2.0	2.8	7.0	9.6	10.8	6.2	4.2
5	2.52	3.95	5.10	3.1	2.6	1.8	2.8	7.0	9.8	10.8	6.2	4.2
6	2.60	4.00	5.00	3.1	2.5	1.9	2.8	7.3	10.1	10.6	6.2	4.2
7	2.70	4.00	5.00	3.4	2.5	1.9	2.8	8.0	10.3	10.4	6.0	4.2
8	2.80	4.00	4.90	3.3	2.5	1.9	2.9	8.3	10.8	10.2	6.0	4.1
9	2.90	4.05	4.80	3.2	2.4	2.0	3.0	8.3	10.5	10.0	5.3	4.1
10	3.00	4.10	4.75	3.1	2.3	1.8	3.1	8.6	10.7	9.9	5.2	4.1
11	3.10	4.20	4.75	3.0	2.4	2.0	3.2	8.9	10.7	9.7	5.0	4.0
12	3.20	4.35	4.72	3.0	2.3	2.0	3.3	8.9	10.9	9.6	4.9	4.0
13	3.30	4.40	4.60	3.0	2.3	1.8	3.4	9.0	10.9	9.5	4.8	4.0
14	3.40	4.58	4.60	3.1	2.3	1.8	3.5	9.1	11.2	9.2	4.7	3.9
15	3.50	4.90	4.50	3.0	2.2	1.8	3.6	9.2	11.4	9.0	4.7	3.9
16	3.62	5.00	4.50	3.2	2.3	1.8	3.7	9.0	11.5	8.9	4.6	3.8
17	3.62	5.10	4.40	3.2	2.2	1.9	3.8	9.0	11.6	8.6	4.6	3.6
18	3.62	5.15	4.40	3.1	2.2	1.9	3.9	9.2	11.8	8.3	4.5	3.6
19	3.62	5.18	4.30	3.0	2.2	1.9	4.0	9.4	11.8	8.2	4.5	3.6
20	3.65	5.20	4.20	2.8	2.2	1.8	4.1	9.3	11.9	8.2	4.2	3.5
21	3.65	5.20	4.10	2.8	2.2	2.0	4.1	9.5	11.8	8.0	4.2	3.5
22	3.65	5.20	4.00	2.7	2.2	2.0	4.1	9.7	11.8	7.7	4.2	3.6
23	3.70	5.20	3.90	2.8	2.2	2.0	4.3	9.5	11.8	7.5	4.2	3.6
24	3.72	5.20	3.80	2.8	2.2	2.0	4.5	9.7	11.6	7.4	4.2	3.6
25	3.72	5.20	3.70	2.6	2.1	2.3	4.9	9.6	11.6	7.4	4.2	3.6
26	3.75	5.20	3.60	2.6	2.2	2.3	5.5	9.4	11.7	7.2	4.2	3.6
27	3.80	5.25	3.50	2.6	2.1	2.4	5.8	9.4	11.6	7.1	4.2	3.6
28	3.80	5.10	3.62	2.6	2.1	2.5	6.1	9.3	11.6	7.0	4.2	3.7
29	3.82	5.10	3.50	2.6	......	2.5	6.3	9.2	11.4	6.8	4.2	3.6
30	3.82	5.10	3.55	2.6	......	2.6	6.7	8.9	11.4	6.7	4.2	3.6
31	3.85	......	3.55	2.6	......	2.6	......	8.9	......	6.7	4.2	......

NOTE.—No readings taken at Mishell's ferry June 15 to Sept. 19; gage heights listed for that period computed by means of a relation curve from heights taken by the Reclamation Service at Newell Tunnel. The readings at Mishell's ferry from about Apr. 21 to June 14 discarded as probably unreliable; gage heights listed computed by means of relation curves as follows: Apr. 30 and May 3 to June 14, from Newell Tunnel records; Apr. 21-29 and May 1-2 from Flathead Lake records at Polson.

Daily discharge, in second-feet, of Flathead River near Polson, Mont., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	3,720	5,900	9,000	5,040	3,600	3,010	3,600	14,800	25,800	41,000	14,400	6,520
2	3,720	6,000	9,000	4,850	3,600	3,010	3,740	15,700	26,400	39,000	13,600	6,520
3	3,760	6,000	9,000	4,170	3,600	2,900	3,880	15,700	26,400	38,400	13,200	6,520
4	3,780	6,000	9,000	4,170	3,600	2,900	3,880	16,200	29,800	37,100	12,800	6,520
5	3,900	6,100	9,000	4,330	3,600	2,690	3,880	16,200	31,000	37,100	12,800	6,520
6	4,000	6,200	8,700	4,330	3,470	2,790	3,880	17,500	32,800	35,900	12,800	6,520
7	4,120	6,200	8,700	4,850	3,470	2,790	3,880	21,000	34,000	34,600	12,000	6,520
8	4,240	6,200	8,410	4,670	3,470	2,790	4,020	22,600	37,100	33,400	12,000	6,290
9	4,370	6,300	8,130	4,500	3,350	2,900	4,170	22,600	35,200	32,200	9,620	6,290
10	4,500	6,410	8,000	4,330	3,230	2,690	4,330	24,200	36,500	31,600	9,310	6,290
11	4,640	6,630	8,000	4,170	3,350	2,900	4,500	25,800	36,500	30,400	8,700	6,060
12	4,790	6,980	7,910	4,170	3,230	2,900	4,670	25,800	37,800	29,800	8,400	6,060
13	4,950	7,100	7,600	4,170	3,230	2,690	4,850	26,400	37,800	29,300	8,110	6,060
14	5,110	7,550	7,600	4,330	3,230	2,690	5,040	27,000	39,700	27,500	7,820	5,840
15	5,280	8,410	7,350	4,170	3,120	2,690	5,230	27,500	41,000	26,400	7,820	5,840
16	5,490	8,700	7,350	4,500	3,230	2,690	5,430	26,400	41,600	25,800	7,540	5,630
17	5,490	9,000	7,100	4,500	3,120	2,790	5,630	26,400	42,300	24,200	7,540	5,230
18	5,490	9,160	7,100	4,330	3,120	2,790	5,840	27,500	43,600	22,600	7,270	5,230
19	5,490	9,250	6,860	4,170	3,120	2,790	6,060	28,700	43,600	22,000	7,270	5,230
20	5,540	9,310	6,630	3,880	3,120	2,690	6,290	28,100	44,200	22,000	6,520	5,040
21	5,540	9,310	6,410	3,880	3,120	2,900	6,290	29,300	43,600	21,000	6,520	5,040
22	5,540	9,310	6,200	3,740	3,120	2,900	6,290	30,400	43,600	19,500	6,520	5,230
23	5,630	9,310	6,000	3,880	3,120	2,900	6,760	29,300	43,600	18,500	6,520	5,230
24	5,670	9,310	5,810	3,880	3,120	2,900	7,270	30,400	42,300	18,000	6,520	5,230
25	5,670	9,310	5,630	3,600	3,010	3,230	8,400	29,800	42,300	18,000	6,520	5,230
26	5,720	9,310	5,450	3,600	3,120	3,230	10,200	28,700	42,900	17,100	6,520	5,230
27	5,810	9,470	5,280	3,600	3,010	3,350	11,300	28,700	42,300	16,600	6,520	5,230
28	5,810	9,000	5,490	3,600	3,010	3,470	12,400	28,100	42,300	16,200	6,520	5,430
29	5,850	9,000	5,280	3,600	....	3,470	13,200	27,500	41,000	15,300	6,520	5,230
30	5,850	9,000	5,360	3,600	....	3,600	14,800	25,800	41,000	14,800	6,520	5,230
31	5,900	....	5,360	3,600	....	3,600	....	25,800	....	14,800	6,520	....

NOTE.—Discharge determined from a well-defined rating curve.

Monthly discharge of Flathead River near Polson, Mont., for the year ending Sept. 30, 1911.

[Drainage area, 7,010 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	5,900	3,720	5,010	0.715	0.82	308,000	A.
November	9,470	5,900	7,860	1.12	1.25	468,000	A.
December	9,000	5,280	7,180	1.02	1.18	441,000	A.
January	5,040	3,600	4,140	.591	.68	255,000	A.
February	3,600	3,010	3,270	.466	.49	182,000	A.
March	3,600	2,690	2,960	.422	.49	182,000	A.
April	14,800	3,600	6,320	.902	1.01	376,000	B.
May	30,400	14,800	24,800	3.54	4.08	1,520,000	B.
June	44,200	25,800	38,300	5.46	6.09	2,280,000	B.
July	41,000	14,800	26,100	3.72	4.29	1,600,000	B.
August	14,400	6,520	8,750	1.25	1.44	538,000	B.
September	6,520	5,040	5,770	.823	.92	343,000	B.
The year	44,200	2,690	11,700	1.67	22.74	8,490,000	

MIDDLE FORK OF FLATHEAD RIVER AT BELTON, MONT.

Location.—Opposite Hotel Belton, near the south line of sec. 25, T. 32 N., R. 18 W., half a mile below the highway bridge at Belton, Mont., about 2 miles above the junction of Lake McDonald outlet.

Records available.—October 15, 1910, to Setember 30, 1911.

Drainage area.—900 square miles.

Gage.—Sloping gage on the left bank directly back of Hotel Belton.

Channel.—Practically permanent.

Discharge measurements.—Made from a cable 200 feet below the gage.

Winter flow.—Stream freezes over at gage for short periods during winter months, but is open at control section below gage.

Accuracy.—Results excellent; winter records probably reliable except for short periods during extremely cold weather.

Discharge measurements of Middle Fork of Flathead River at Belton, Mont., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 15	W. A. Lamb	3.54	1,380	Mar. 16[a]	W. A. Lamb	2.05	415
Nov. 25	B. E. Jones	4.02	1,790	16	do	2.05	439
				June 28	do	6.95	6,420
1911.				Aug. 6	J. C. Beebe	3.36	1,250
Jan. 5	do	2.33	669	Sept. 22	W. A. Lamb	3.64	1,420

[a] Meter out of order; results low.

Daily gage height, in feet, of Middle Fork of Flathead River at Belton, Mont., for the year ending Sept. 30, 1911.

[L. E. Smith, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	3.70	3.35	2.0	2.2	2.2	3.9	6.0	8.5	6.3	3.6	......
2	......	3.60	3.30	2.0	2.1	2.2	3.8	6.4	9.7	6.2	3.5	......
3	......	3.52	3.30	2.3	2.2	2.2	3.7	6.7	9.5	6.0	3.5	......
4	......	3.50	3.22	2.4	2.3	2.2	3.6	7.4	9.1	6.0	3.4	......
5	......	3.38	3.15	2.4	2.3	2.0	3.5	8.5	8.5	5.9	3.4	......
6	......	3.30	3.10	2.3	2.3	2.0	3.4	9.4	7.9	5.8	3.4	......
7	......	3.22	3.02	2.2	2.3	2.0	3.3	8.2	7.6	5.6	3.4	......
8	......	3.68	2.98	2.1	2.3	1.9	3.2	7.7	8.0	5.5	3.4	......
9	......	4.22	3.00	2.1	2.2	1.9	3.3	7.6	7.6	5.2	3.4	......
10	......	4.15	2.92	1.7	2.2	1.9	3.5	7.2	7.9	5.1	3.4	......
11	......	5.22	2.62	2.0	2.1	1.9	3.6	6.7	8.6	5.0	3.3	......
12	......	5.50	2.62	1.7	2.0	1.9	3.5	6.6	9.0	4.8	3.4	3.0
13	......	5.50	2.70	2.3	2.0	1.9	3.4	6.6	8.8	4.7	3.3	3.0
14	......	5.40	2.68	2.4	2.0	2.0	3.4	6.8	9.1	4.6	3.3	3.0
15	3.54	4.90	2.60	2.4	2.0	2.0	3.3	6.8	8.7	4.6	3.2	3.0
16	3.48	4.65	2.52	2.4	2.0	2.0	3.5	8.5	8.1	4.5	......	3.0
17	3.40	4.40	2.72	2.4	2.0	2.2	3.8	8.3	8.0	4.5	......	......
18	3.40	4.20	2.68	2.4	2.0	2.4	4.0	7.7	7.7	4.5	......	......
19	3.38	4.08	2.55	2.4	2.0	2.8	4.4	7.2	7.4	4.4	......	......
20	3.25	3.95	2.40	2.3	2.2	3.1	5.0	6.8	7.2	4.4	......	......
21	3.15	3.95	2.28	2.3	2.2	3.4	5.6	6.7	7.0	4.3	......	......
22	3.08	4.45	2.50	2.2	2.2	3.9	6.4	6.6	7.0	4.2	......	......
23	3.00	4.30	2.50	2.4	2.2	4.2	6.9	6.7	6.9	4.2	......	3.6
24	3.00	4.18	2.60	2.2	2.3	4.3	6.8	6.8	6.6	4.2	......	3.5
25	3.18	4.00	2.55	2.2	2.2	4.1	7.3	6.9	7.2	4.1	......	3.5
26	5.22	3.88	2.50	2.3	2.2	3.8	7.7	7.0	6.8	4.0	......	3.5
27	4.95	3.75	2.50	2.2	2.2	3.7	7.8	7.1	6.5	3.9	......	3.6
28	4.50	3.60	2.48	2.2	2.2	3.5	7.1	7.1	7.2	3.8	......	3.5
29	4.25	3.55	2.42	2.2	......	3.4	6.6	7.2	6.8	3.8	......	3.5
30	4.05	3.45	2.45	2.2	......	3.6	5.6	7.4	6.7	3.7	......	3.5
31	3.90	......	2.42	2.3	......	3.8	......	7.8	......	3.6	......	......

Daily discharge, in second-feet, of Middle Fork of Flathead River at Belton, Mont., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	1,490	1,200	440	520	520	1,680	4,550	9,800	5,090	1,400	1,010
2	....	1,400	1,170	440	480	520	1,580	5,280	12,600	4,910	1,320	1,010
3	....	1,340	1,170	570	520	520	1,490	5,870	12,200	4,550	1,320	1,000
4	....	1,320	1,110	620	570	520	1,400	7,330	11,200	4,550	1,240	1,000
5	....	1,230	1,060	620	570	440	1,320	9,800	9,800	4,370	1,240	995
6	....	1,170	1,030	570	570	440	1,240	11,900	8,430	4,200	1,240	990
7	....	1,110	974	520	570	440	1,170	9,110	7,770	3,860	1,240	985
8	....	1,470	948	480	570	400	1,100	7,990	8,650	3,700	1,240	980
9	....	2,010	960	480	520	400	1,170	7,770	7,770	3,240	1,240	975
10	....	1,940	912	340	520	400	1,320	6,910	8,430	3,100	1,240	970
11	....	3,270	732	440	480	400	1,400	5,870	10,000	2,960	1,170	965
12	....	3,700	732	340	440	400	1,320	5,670	11,000	2,700	1,240	960
13	....	3,700	780	570	440	400	1,240	5,670	10,500	2,570	1,170	960
14	....	3,540	768	620	440	440	1,240	6,070	11,200	2,450	1,170	960
15	1,350	2,830	720	620	440	440	1,170	6,070	10,300	2,450	1,100	960
16	1,300	2,510	680	620	440	440	1,320	9,800	8,880	2,330	1,090	960
17	1,240	2,210	792	620	440	520	1,580	9,340	8,650	2,330	1,090	1,030
18	1,240	1,990	768	620	440	620	1,780	7,990	7,990	2,330	1,080	1,100
19	1,230	1,860	695	620	440	840	2,210	6,910	7,330	2,210	1,080	1,170
20	1,140	1,730	620	570	520	1,030	2,960	6,070	6,910	2,210	1,070	1,240
21	1,060	1,730	560	570	520	1,240	3,860	5,870	6,490	2,100	1,070	1,320
22	1,020	2,270	670	520	520	1,680	5,280	5,670	6,490	1,990	1,060	1,340
23	960	2,100	670	620	520	1,990	6,280	5,870	6,280	1,990	1,060	1,400
24	960	1,970	720	520	570	2,100	6,070	6,070	5,670	1,990	1,050	1,320
25	1,090	1,780	695	520	520	1,880	7,120	6,280	6,910	1,880	1,050	1,320
26	3,270	1,660	670	570	520	1,580	7,990	6,490	6,070	1,780	1,040	1,320
27	2,900	1,540	670	520	520	1,490	8,210	6,700	5,470	1,680	1,040	1,400
28	2,330	1,400	660	520	520	1,320	6,700	6,700	6,910	1,580	1,030	1,320
29	2,040	1,360	630	520	....	1,240	5,670	6,910	6,070	1,580	1,030	1,320
30	1,830	1,280	645	520	....	1,400	3,860	7,330	5,870	1,490	1,020	1,320
31	1,680	....	630	570	....	1,580	....	8,210	....	1,400	1,020	....

NOTE.—Discharge determined from a rating curve well defined between 1,100 and 8,000 second-feet, and fairly well defined outside those limits. Discharge interpolated for days for which gage heights are missing.

Monthly discharge of Middle Fork of Flathead River at Belton, Mont., for the year ending Sept. 30, 1911.

[Drainage area, 900 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October 15-31	3,270	960	1,570	1.74	1.10	52,900	B.
November	3,700	1,110	1,960	2.18	2.43	117,000	B.
December	1,200	560	808	.898	1.04	49,700	B.
January	620	340	538	.598	.69	33,100	B.
February	570	440	505	.561	.58	28,000	B.
March	2,100	400	891	.990	1.14	54,800	B.
April	8,210	1,100	3,020	3.36	3.75	180,000	A.
May	11,900	4,550	7,030	7.81	9.00	432,000	B.
June	12,600	5,470	8,390	9.32	10.40	499,000	B.
July	5,090	1,400	2,760	3.07	3.54	170,000	A.
August	1,400	1,020	1,140	1.27	1.46	70,100	C.
September	1,400	960	1,120	1.24	1.38	66,600	C.
The period	....	....	....	....	....	1,750,000	

SOUTH FORK OF FLATHEAD RIVER NEAR COLUMBIA FALLS, MONT.

Location.—In the NW. ¼ SW. ¼ sec. 4, T. 30 N., R. 19 W., at highway bridge, half a mile above junction with Flathead River and about 7 miles east of Columbia Falls.

Records available.—September 20, 1910, to September 30, 1911. (No gage height record during 1910.)

Drainage area.—1,640 square miles.

Gage.—Standard chain on right span of bridge.

Channel.—Gravel and small rock. Control probably permanent.

Discharge measurements.—Made from bridge.

Winter flow.—Affected by ice.

Diversions.—None.

Accuracy.—Gage heights probably affected by logs lodging on banks and control and also probably by backwater from Flathead River. Rating curve fairly well defined.

Cooperation.—Gage heights and some discharge measurements furnished by United States Forest Service.

Discharge measurements of South Fork of Flathead River near Columbia Falls, Mont., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		Feet.	Sec.-ft.			Feet.	Sec.-ft.
Sept. 20	Richards and Heidel	3.12	597	May 19[b]	F. E. Bonner	8.92	12,300
Oct. 14	W. A. Lamb	4.05	1,460	June 30	W. A. Lamb	7.25	9,670
Nov. 27	B. E. Jones	4.55	2,500	Aug. 10	J. C. Beebe	4.01	1,750
				Sept. 20	W. A. Lamb	3.48	920
1911.							
Jan. 4[a]	do	3.67	820				

[a] Ice present.

[b] This measurement not used in developing curve, as its area of section is not consistent with other areas.

Daily gage height, in feet, of South Fork of Flathead River near Columbia Falls, Mont., for the year ending Sept. 30, 1911.

[J. F. Kruse, observer.]

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	3.7			6.5		6.7	4.1	
2					9.5			3.2
3			4.6					
4						6.5		3.4
5						6.5	3.7	
6							4.4	
7			4.2	9.3				
8				9.2	9.2			
9				9.4			4.1	
10						5.9	4.0	
11			4.4		9.3			
12					10.3	5.8		
13					10.5			3.1
14			4.2					
15						5.0		
16			3.8					
17		4.2				4.7		
18				8.4				3.2
19		4.4		8.5				
20	4.1							3.5
21			6.0		8.7			
22		4.5		6.9				
23		4.5			8.3		3.3	3.7
24			6.2					
25				6.6				
26								
27								
28				5.9				
29		4.2						
30					7.2			
31		4.4						

Daily discharge, in second-feet, of South Fork of Flathead River near Columbia Falls, Mont., for the year ending Sept. 30, 1911.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1,170	1,770	2,330	7,300	15,400	7,920	1,720	654
2	1,200	1,780	2,450	8,930	17,900	7,710	1,580	645
3	1,230	1,790	2,570	10,600	17,700	7,500	1,440	740
4	1,260	1,790	2,400	12,200	17,500	7,300	1,310	835
5	1,290	1,800	2,220	13,800	17,300	7,300	1,170	800
6	1,320	1,800	2,050	15,400	17,100	6,960	2,210	770
7	1,340	1,810	1,880	17,100	16,900	6,610	2,050	740
8	1,370	1,820	1,960	16,700	16,700	6,260	1,880	710
9	1,400	1,820	2,040	17,500	16,800	5,910	1,720	680
10	1,430	1,830	2,130	17,100	17,000	5,560	1,570	650
11	1,460	1,830	2,210	16,700	17,100	5,420	1,500	620
12	1,490	1,840	2,100	16,200	21,000	5,290	1,440	590
13	1,520	1,850	1,990	15,800	21,800	4,660	1,380	560
14	1,550	1,850	1,880	15,400	20,900	4,020	1,310	577
15	1,580	1,860	1,590	15,000	20,000	3,380	1,250	594
16	1,600	1,870	1,300	14,500	19,200	3,070	1,180	611
17	1,630	1,880	2,210	14,100	18,300	2,760	1,120	628
18	1,660	2,040	3,120	13,700	17,400	2,700	1,060	645
19	1,690	2,210	4,030	14.100	16,600	2,630	991	792
20	1,720	2,270	4,940	12,300	15,700	2,560	927	940
21	1,730	2,330	5,840	10,400	14,800	2,490	863	1,020
22	1,730	2,390	6,030	8,560	14,100	2,420	799	1,090
23	1,740	2,390	6,220	8,250	13,400	2,350	735	1,170
24	1,740	2,300	6,410	7,930	12,800	2,280	726	1,150
25	1,750	2,220	6.540	7,610	12,300	2,210	717	1,140
26	1,760	2,140	6,660	6,920	11,700	2,140	708	1,130
27	1,760	2,050	6,790	6.240	11,200	2,070	699	1,120
28	1,770	1,960	6,920	5,560	10,600	2,000	690	1,110
29	....	1,880	7,040	8,020	10,100	1,930	681	1,100
30	....	2,040	7,170	10,500	9,540	1,860	672	1,090
31	....	2,210	....	13,000	....	1,790	663	....

NOTE.—Discharge determined from a fairly well defined rating curve. Discharge interpolated for days for which gage heights are missing. Accuracy values impaired because of broken gage-height record.

Monthly discharge of South Fork of Flathead River near Columbia Falls, Mont., for the year ending Sept. 30, 1911.

[Drainage area, 1,640 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
February	1,770	1,170	1,530	0.933	0.97	85,000	D.
March	2,390	1,770	1,980	1.21	1.40	122,000	C.
April	7,170	1,300	3,770	2.30	2.57	224,000	C.
May	17,500	5,560	12,200	7.44	8.58	750,000	C.
June	21,800	9,540	16,000	9.76	10.89	952,000	C.
July	7,920	1,790	4,160	2.54	2.93	256,000	C.
August	2,210	663	1,190	.726	.84	73,200	C.
September	1,170	560	830	.506	.56	49,400	C.
The period	....	....	....	....	....	2,510,000	

SWAN RIVER NEAR BIG FORK, MONT.

Location.—In sec. 27, T. 25 N., R. 18 W., half a mile above Bog cabin, 2 miles above Swan Lake, 1½ miles from the Swan River ranger station and 20 miles from Big Fork.

Records available.—October 10, 1910, to May 22, 1911, when station was discontinued.

Drainage area.—653 square miles.

Gage.—Vertical staff.

Channel.—Gravel and small rock; probably permanent.

Discharge measurements.—Made by wading.

Winter flow.—Affected by ice.

Accuracy.—Station discontinued because no observer was available. No rating curve developed. Gage heights were affected by backwater from Swan Lake during high water.

Cooperation.—Field data furnished by United States Forest Service.

The following discharge measurement was made by J. C. Beebe:

October 10, 1910: Gage height, 1.11 feet; discharge, 557 second-feet.

Daily gage height, in feet, of Swan River near Big Fork, Mont., for the year ending Sept. 30, 1911.

[B. Sutherland, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.
1		1.37	1.31		0.64	0.37		
2				1.13			1.74	2.47
3		1.29	1.26		.64	.32		
4				.71			1.68	2.53
5		1.19	1.29		.62	.33		
6				1.00			1.48	3.74
7		1.14	1.20		.59	.34		
8				.91			1.38	3.73
9		1.41	1.15		.55	.34		
10	1.11			.95			1.42	3.31
11		1.87	.84		.59	.35		
12	1.11			.83			1.44	2.83
13		2.26	1.08		.59	.38		
14	.98			.94			1.33	2.86
15		1.87	.87		.58	.41		
16	1.02			.65			1.28	2.91
17		1.61	1.03		.55	.51		
18	1.03			.83			1.34	3.14
19		1.48	.87		.37	.59		
20	1.02			.80			1.49	2.93
21		1.59	.83		.47	.82		
22	.97			.72			1.87	2.60
23		1.75	.92		.53	1.03		
24	.94			.59			2.39	
25		1.61	.95		.41	1.28		
26	1.30			.63			2.74	
27		1.49	.93		.61	1.24		
28	1.41			.62			3.01	
29		1.41	.91			1.07		
30	1.39			.67			2.65	
31			.91			1.48		

LITTLE BITTERROOT RIVER NEAR MARION, MONT.

Location.—At the log bridge just below the outlet of Little Bitterroot Lake near Marion, Mont.

Records available.—January 1, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Practically permanent in natural condition. In spring of 1911 channel both above and below gage was cleaned.

Discharge measurements.—Made by wading.

Winter flow.—Not seriously affected by ice.

Accuracy.—Rating curves fairly well defined. A change in curves for 1910 and 1911 was caused by cleaning the channel in the spring of 1911.

Discharge measurements of Little Bitterroot River near Marion, Mont., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 24	W. A. Lamb	1.25	9.3
24	....do	1.25	9.4
Aug. 4	J. C. Beebe	.77	3.8

Daily gage height, in feet, of Little Bitterroot River near Marion, Mont., for the year ending Sept. 30, 1911.

[Byrl Kelsey, observer.]

Day.	Oct.	Nov.	Dec.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.25					1.65	1.70		0.60
2		0.85	0.95		1.20			0.75	
3	1.35					1.65	1.70		.55
4		.85	1.05		1.20			.80	
5	1.35					1.65	1.60		.60
6		.75	1.05		1.50			.80	
7	1.45					1.60	1.60		.65
8		.85	.95		1.60			.90	
9	1.5					1.60	1.60		.70
10		.9	1.0		1.60			.80	
11	1.45					1.60	1.60		.60
12		.95	.95		1.60			.75	
13	1.35					1.60	1.50		.60
14		1.05	.85		1.70			.70	
15	1.25					1.60	1.40		.60
16		1.15	.85		1.70			.75	
17	1.25					1.55	1.25		.55
18		1.1	.9		1.70			.65	
19	1.3					1.55	1.00		.60
20		.95	.85		1.60			.70	
21	1.15					1.60	1.05		.55
22		.95	.85		1.60			.70	
23	1.15					1.50	.95		.55
24		.95	.85	1.20	1.60			.60	
25	1.05					1.70	.90		.60
26		1.05	.75	1.20	1.60			.60	
27	1.1					1.75	.75		.55
28		1.0	.65	1.20	1.60			.55	
29	.85					1.70	.75		.55
30		.95	.7	1.20	1.60			.60	
31	.85						.75		

Daily discharge, in second-feet, of Little Bitterroot River near Marion, Mont., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Apr.	May.	June.	July.	Aug.	Sept.
1	6.3	2.6	3.2	....	8.7	16	18	3.7	2.6
2	7.0	2.6	3.2	....	8.7	16	18	3.7	2.5
3	7.8	2.6	3.6	....	8.7	16	18	3.9	2.4
4	7.8	2.6	4.0	....	8.7	16	17	4.1	2.5
5	7.8	2.3	4.0	....	11	16	16	4.1	2.6
6	8.6	2.0	4.0	....	14	16	16	4.1	2.8
7	9.4	2.3	3.6	....	15	16	16	4.6	3.0
8	9.8	2.6	3.2	....	16	16	16	5.0	3.2
9	10.2	2.7	3.4	....	16	16	16	4.6	3.3
10	9.8	2.8	3.5	....	16	16	16	4.1	3.0
11	9.4	3.0	3.4	....	16	16	16	3.9	2.6
12	8.6	3.2	3.2	....	16	16	15	3.7	2.6
13	7.8	3.6	2.9	....	17	16	14	3.5	2.6
14	7.0	4.0	2.6	....	18	16	13	3.3	2.6
15	6.3	4.5	2.6	....	18	16	12	3.5	2.6
16	6.3	5.0	2.6	....	18	15	11	3.7	2.5
17	6.3	4.7	2.7	....	18	14	9.4	3.4	2.4
18	6.6	4.4	2.8	....	18	14	7.7	3.0	2.5
19	7.0	3.8	2.7	....	17	14	6.0	3.2	2.6
20	6.0	3.2	2.6	....	16	15	6.3	3.3	2.5
21	5.0	3.2	2.6	....	16	16	6.6	3.3	2.4
22	5.0	3.2	2.6	....	16	15	6.0	3.3	2.4
23	5.0	3.2	2.6	....	16	14	5.5	3.0	2.4
24	4.5	3.2	2.6	8.7	16	16	5.2	2.6	2.5
25	4.0	3.6	2.3	8.7	16	18	5.0	2.6	2.6
26	4.2	4.0	2.0	8.7	16	18	4.4	2.6	2.5
27	4.4	3.8	1.8	8.7	16	19	3.7	2.5	2.4
28	3.5	3.5	1.6	8.7	16	18	3.7	2.4	2.4
29	2.6	3.4	1.7	8.7	16	18	3.7	2.5	2.4
30	2.6	3.2	1.8	8.7	16	18	3.7	2.6	2.5
31	2.6	....	1.8	....	16	....	3.7	2.6	....

NOTE.—Discharge determined from two fairly well-defined rating curves, one applicable for 1910 and the other for 1911. Discharge interpolated for days for which gage heights are missing.

Monthly discharge of Little Bitterroot River near Marion, Mont., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	10.2	2.6	6.4	394	B.
November	5.0	2.0	3.3	196	C.
December	4.0	1.6	2.8	172	B.
April 24-30	8.7	8.7	8.70	121	B.
May	18	8.7	15.2	935	B.
June	19	14	16.1	958	B.
July	18	3.7	10.6	652	B.
August	5.0	2.4	3.43	211	B.
September	3.3	2.4	2.60	155	B.

LITTLE BITTERROOT RIVER NEAR HUBBART, MONT.

Location.—Above the canyon leading to the second fall of the Little Bitterroot, 1½ miles west of the ranch buildings of the Hubbart Cattle Co., near Hubbart post office and 15 miles south of Marion.

Records available.—April 22, 1909, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff. From April 22 to October 17, 1909, the gage was located in box canyon below the falls, about 1 mile downstream. The relation between gages at the two locations was not determined.

Channel.—Apparently permanent.

Discharge measurements.—Made by wading.

Winter flow.—Affected by ice.

Accuracy.—Results good.

Discharge measurements of Little Bitterroot River near Hubbart, Mont., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 25	W. A. Lamb	2.30	65
Aug. 4	J. C. Beebe	1.53	15.4

Daily gage height, in feet, of Little Bitterroot River near Hubbart, Mont., for the year ending Sept. 30, 1911.

[W. K. Hubbart, observer.]

Day.	Oct.	Nov.	Apr.	May.	June.	July	Aug.	Sept.
1	1.60		2.00	2.30			1.50	
2		1.55			2.15	2.00		1.60
3	1.55		2.00	2.15			1.50	
4		1.55			2.10	1.97		1.60
5	1.55		1.80	2.20			1.50	
6		1.55			2.10	1.95		1.50
7	1.55		1.90	2.30				
8		1.55			2.05	1.90		1.45
9	1.55		1.90	2.45				
10		1.60			2.00	1.83		1.45
11	1.55		1.80	2.45				
12		1.60			1.92	1.80		1.45
13	1.55		1.70	2.40				
14		1.60			1.87	1.80		1.40
15	1.55		1.70	2.50				
16		1.60			1.83	1.75		1.40
17	1.55		1.90	2.45				
18		1.55			1.82	1.68		1.40
19	1.55		1.90	2.30			1.48	
20		1.55			1.90	1.66		1.40
21	1.55		1.90	2.30			1.52	
22		1.55			2.20	1.64		1.40
23	1.55		2.00	2.25			1.58	
24		1.55			2.30	1.60		1.40
25	1.55		2.30	2.20			1.85	
26		1.55			2.35	1.57		1.40
27	1.55		2.40	2.20			1.85	
28		1.55			2.50	1.55		1.40
29	1.55		2.40	2.15			1.75	
30		1.55			2.20	1.52		1.40
31	1.55			2.15			1.70	

Daily discharge, in second-feet, of Little Bitterroot River near Hubbart, Mont., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Apr.	May.	June.	July.	Aug.	Sept.
1	19	16	44	65	54	51	13	22
2	18	16	44	60	54	44	13	19
3	16	16	44	54	52	43	13	19
4	16	16	38	56	51	42	13	19
5	16	16	31	58	51	41	13	16
6	16	16	34	62	51	40	13	13
7	16	16	37	65	50	38	13	12
8	16	16	37	70	48	37	13	10
9	16	18	37	76	46	35	13	10
10	16	19	34	76	44	33	13	10
11	16	19	31	76	41	32	13	10
12	16	19	28	74	38	31	12	10
13	16	19	25	72	36	31	12	9.0
14	16	19	25	76	35	31	12	8.0
15	16	19	25	80	34	30	12	8.0
16	16	19	31	78	33	28	12	8.0
17	16	18	37	76	32	26	12	8.0
18	16	16	37	70	32	24	12	8.0
19	16	16	37	65	34	24	12	8.0
20	16	16	37	65	37	23	13	8.0
21	16	16	37	65	48	22	14	8.0
22	16	16	40	64	58	21	16	8.0
23	16	16	44	62	62	20	18	8.0
24	16	16	54	60	65	19	26	8.0
25	16	16	65	58	66	18	34	8.0
26	16	16	68	58	68	17	34	8.0
27	16	16	72	58	74	16	34	8.0
28	16	16	72	56	80	16	31	8.0
29	16	16	72	54	69	15	28	8.0
30	16	16	68	54	58	14	26	8.0
31	16	....	....	54	....	14	25	....

NOTE.—Discharge determined from a rating curve well defined above 12 second-feet. Discharge interpolated for days for which gage heights are missing.

Monthly discharge of Little Bitterroot River near Hubbart, Mont., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	19	16	16	984	B.
November	19	16	17	1,010	B.
December	....	....	[a] 16	984	D.
April	72	25	42.8	2,550	A.
May	80	54	65.1	4,000	A.
June	80	32	50.0	2,980	A.
July	51	14	28.3	1,740	A.
August	34	12	17.4	1,070	A.
September	22	8.0	10.5	625	A.

[a] Estimated.

CROW CREEK NEAR RONAN, MONT.

Location.—At old highway bridge about one-fourth mile above the present bridge on the stage road from St. Ignatius to Ronan, 4 miles south of Ronan, and above the mouth of Spring Creek.

Records available.—September 21, 1906, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Staff gage on left abutment.

Channel.—Shifts at high stages; current sluggish.

Discharge measurements.—Made by wading or from bridge.

Winter flow.—Affected by ice.

Diversions.—No water is diverted above the station.

Accuracy.—Results good.

Discharge measurements of Crow Creek near Ronan, Mont., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
1910.				Apr. 19	W. A. Lamb	1.10	24
Oct. 4	B. E. Jones	1.12	22	19	.....do	1.10	24.6
				June 12	.....do	5.83	393
1911.				July 5	B. E. Jones	4.63	221
Jan. 14[a]	.....do	1.02	9.8	Aug. 2	W. A. Lamb	2.00	60
Mar. 24	.....do	1.30	31	Sept. 18	.....do	1.25	31

[a] Stream frozen; measurement made through holes in ice.

Daily gage height, in feet, of Crow Creek near Ronan, Mont., for the year ending Sept. 30, 1911.

[A. McIntyre, observer.]

Day.	Oct.	Nov.	Dec.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1		1.20	1.20		1.00	2.2	3.1	5.1	2.0	1.30
2	1.05	1.25	1.20		1.00	2.2	3.9	4.7	1.95	1.30
3	1.05	1.25	1.18		.95	2.3		4.7	1.90	1.25
4	1.12	1.25	1.15		1.00	2.8		4.7	1.90	1.85
5	1.01	1.30	1.15		.95	3.3		4.5	1.90	1.85
6	1.06	1.30	1.15		.90			4.6	1.90	1.75
7	1.05	1.35	1.20		.90			4.4	2.20	1.45
8	1.04	1.30	1.20		.90	3.6		4.0	2.05	1.40
9	1.02	1.32	1.20		.90	3.0		3.9	1.85	1.40
10	1.02	1.40	1.20		.90	2.7		3.8	1.70	1.30
11	1.02	1.50	1.15		.92	2.4		3.6	1.60	1.15
12		1.60	1.20		1.00	2.4	5.7	3.5	1.50	1.20
13		1.60	1.30		.92	2.6	5.8	3.2	1.50	1.20
14		1.58	1.20		.90	2.5	5.7	2.9	1.50	1.20
15		1.48	1.15		.90	2.7	5.5	2.8	1.50	1.10
16	1.10	1.40	1.10		.90	3.0	5.5	2.8	1.50	1.10
17	1.20	1.40	1.10		1.00	3.2	5.5	2.8	1.45	1.20
18	1.30	1.40	1.10		1.00	3.0	5.5	2.8	1.40	1.10
19	1.30	1.40	1.10		1.00	2.8		2.7	1.40	1.15
20	1.18	1.30	1.10		1.00	2.6	5.7	2.7	1.40	1.15
21	1.05	1.30	1.10		1.20	2.6	5.4	2.6	1.45	1.10
22	1.00	1.25	1.10		1.50	2.4	5.2	2.6	1.45	1.85
23	1.00	1.25	1.08		1.90	2.4	5.6	2.6	1.40	1.45
24	1.10	1.20	1.05	1.00	1.95	2.5	6.0	2.6	1.35	1.35
25	1.25	1.20	1.05	1.00	2.1	2.3	5.9	2.6	1.30	1.30
26	1.45	1.20	1.00	1.00	2.1	2.2	5.8	2.4	1.30	1.35
27	1.30	1.20	1.00	1.00	2.2	2.1	5.7	2.4	1.40	1.40
28	1.20	1.15	1.00	1.05	2.3	2.0	5.5	2.4	1.40	1.50
29	1.12	1.15	.90	.95	2.4	2.8	5.4	2.3	1.40	1.45
30	1.10	1.15	.90	.95	2.5	2.4	5.0	2.2	1.30	1.50
31	1.10		.90	1.00		2.3	5.1	2.1	1.30	

NOTE.—Water over gage June 3 to 11. Maximum height estimated from flood marks as about 7.0 feet.

Daily discharge, in second-feet, of Crow Creek near Ronan, Mont., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	20	27	27	....	20	73	130	294	63	31
2	22	29	27	....	20	73	189	258	60	31
3	22	29	26	....	18	79	246	258	58	29
4	24	29	25	....	20	109	303	258	58	56
5	20	31	25	....	18	144	360	240	58	56
6	22	31	25	....	17	213	417	249	58	50
7	22	33	27	....	17	222	475	231	73	37
8	21	31	27	....	17	165	450	197	66	35
9	21	32	27	....	17	123	425	189	56	35
10	21	35	27	....	17	103	400	181	48	31
11	21	39	25	....	18	85	375	165	43	25
12	21	43	27	....	20	85	348	158	39	27
13	22	43	31	....	18	97	357	137	39	27
14	22	42	27	....	17	91	348	116	39	27
15	23	38	25	....	17	103	330	109	39	23
16	23	35	23	....	17	123	330	109	39	23
17	27	35	23	....	20	137	330	109	37	27
18	31	35	23	....	20	123	330	109	35	23
19	31	35	23	....	20	109	339	103	35	25
20	26	31	23	....	20	97	348	103	35	25
21	22	31	23	....	27	97	321	97	37	23
22	20	29	23	....	39	85	303	97	37	56
23	20	29	22	....	58	85	339	97	35	37
24	23	27	22	20	60	91	375	97	33	33
25	29	27	22	20	68	79	366	97	31	31
26	37	27	20	20	68	73	357	85	31	33
27	31	27	20	20	73	68	348	85	35	35
28	27	25	20	22	79	63	330	85	35	39
29	24	25	17	18	85	109	321	79	35	37
30	23	25	17	18	91	85	285	73	31	39
31	23	....	17	20	....	79	....	68	31	....

NOTE.—Discharge determined from a fairly well defined curve. Discharge estimated May 6–7 and June 3–11, and interpolated Oct. 1, 12, to 15, and June 19.

Monthly discharge of Crow Creek near Ronan, Mont., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	37	20	23.9	1,470	B.
November	43	25	31.8	1,890	B.
December	31	17	23.7	1,460	B.
January	....	....	[a] 10.0	615	D.
February	....	....	[a] 10.0	555	D.
March	22	....	16.2	996	C.
April	91	17	33.9	2,020	B.
May	222	63	105	6,460	B.
June	475	130	339	20,200	C.
July	294	68	146	8,980	A.
August	73	31	43.5	2,670	A.
September	56	23	33.5	1,990	B.
The year	475	....	68.1	49,300	

[a] Estimated.

NOTE.—Mean discharge Mar. 1 to 23 estimated 15 second-feet.

CROW CREEK AT LOZEAU'S RANCH, NEAR RONAN, MONT.

Location.—In the E. ½ sec. 15, T. 20 N., R. 21 W., at Louis Lozeau's ranch, about 1 mile below the mouth of Mud Creek, about 2.5 miles from the junction of Crow Creek with Flathead River and about 8 miles southwest of Ronan.

Records available.—April 21 to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff attached to a cottonwood tree on the right bank, 75 feet above the bridge at Lozeau's ranch.

Channel.—Likely to change at high stages. Bed of stream is composed of gravel and cobblestones at the control below the bridge and of gravel and sand at the gage. Current swift at high stages.

Discharge measurements.—Made from bridge at high stages and by wading at medium and low stages.

Diversions.—Water diverted from Mud Creek.

Accuracy.—Results good, except during periods of high water.

Discharge measurements of Crow Creek at Lozeau's ranch, near Ronan, Mont., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 20	W. A. Lamb	1.22	50	Aug. 4	W. A. Lamb	1.60	78
June 13	.....do	2.48	394	Sept. 19	.....do	1.45	52
July 7	B. E. Jones	2.18	249				

Daily gage height, in feet, of Crow Creek near Lozeau's ranch, near Ronan, Mont., for the year ending Sept. 30, 1911.

[Louis Lozeau, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Day.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	1.50	1.60	2.70	1.50	1.40	16	......	1.70	2.50	1.90	1.40	1.40
2	......	1.50	1.90	2.60	1.50	1.40	17	......	1.85	2.40	1.85	1.40	1.40
3	......	1.60	2.10	2.50	1.50	1.40	18	......	1.85	2.40	1.80	1.40	1.40
4	......	1.60	2.30	2.40	1.50	1.50	19	......	1.80	2.40	1.80	1.35	1.40
5	......	1.70	2.35	2.30	1.40	1.55	20	......	1.75	2.30	1.80	1.30	1.40
6	......	1.90	2.30	2.25	1.50	1.50	21	1.20	1.70	2.30	1.75	1.30	1.40
7	......	2.10	2.00	2.20	1.50	1.50	22	1.30	1.65	2.30	1.75	1.30	1.45
8	......	2.00	2.20	2.15	1.50	1.50	23	1.40	1.60	2.30	1.60	1.30	1.60
9	......	1.80	2.40	2.05	1.50	1.50	24	1.50	1.60	2.40	1.60	1.40	1.60
10	......	1.80	2.40	2.20	1.50	1.50	25	1.50	1.60	2.90	1.60	1.40	1.50
11	......	1.70	2.20	2.20	1.50	1.50	26	1.60	1.60	3.20	1.60	1.35	1.50
12	......	1.65	2.30	1.90	1.40	1.40	27	1.60	1.60	3.00	1.50	1.35	1.50
13	......	1.60	2.50	1.90	1.40	1.40	28	1.70	1.60	3.10	1.50	1.40	1.50
14	......	1.80	2.55	1.90	1.40	1.40	29	1.65	1.50	3.40	1.50	1.40	1.50
15	......	1.70	2.60	1.90	1.40	1.40	30	1.60	1.60	2.90	1.50	1.40	1.50
							31	......	1.55	......	1.50	1.40	......

Daily discharge, in second-feet, of Crow Creek at Lozeau's ranch, near Ronan, Mont., for the year ending Sept. 30, 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Day.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	100	124	515	61	46	16	......	152	405	150	46	46
2	......	100	215	460	61	46	17	......	199	355	136	46	46
3	......	124	386	405	61	46	18	......	199	355	122	46	46
4	......	124	360	355	61	61	19	......	183	355	122	40	46
5	......	152	380	305	46	70	20	......	167	305	122	33	46
6	......	215	330	282	61	61	21	48	152	305	110	33	46
7	......	386	210	259	61	61	22	63	138	305	110	33	54
8	......	249	280	238	61	61	23	80	124	305	78	33	78
9	......	183	340	200	61	61	24	100	124	355	78	46	78
10	......	183	340	259	61	61	25	100	124	635	78	46	61
11	......	152	260	259	61	61	26	124	124	830	78	40	61
12	......	138	305	150	46	46	27	124	124	700	61	40	61
13	......	124	405	150	46	46	28	152	124	765	61	46	61
14	......	183	432	150	46	46	29	138	100	960	61	46	61
15	......	152	460	150	46	46	30	124	124	635	61	46	61
							31	......	112	......	61	46	......

NOTE.—Discharge determined as follows: Apr. 21 to June 3, from fairly well-defined rating curve; June 14 to Sept. 30, from a well-defined curve; June 4 to 13, by indirect method for shifting channels.

Monthly discharge of Crow Creek at Lozeau's ranch, near Ronan, Mont., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April 21-30	152	48	105	2,080	A.
May	386	100	156	9,590	B.
June	960	124	413	24,600	B.
July	515	61	181	11,100	A.
August	61	33	48.6	2,990	A.
September	78	46	55.7	3,310	A.
The period	....	....	....	53,700	

MISSION CREEK NEAR ST. IGNATIUS, MONT.

Location.—In the SW. ¼ sec. 10, T. 18 N., R. 20 W., at the house of A. A. Booke, about 1 mile downstream from St. Ignatius.

Records available.—September 21, 1906, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff. Original gage was destroyed July 5, 1907. A new gage was installed July 24, 1907, a short distance downstream and with a datum 0.30 foot lower. On January 25, 1908, this gage was lowered 0.39 foot. On June 7, 1908, the gage was again destroyed and June 26, 1908, the present gage was installed 20 feet downstream and at a different datum.

Channel.—Shifts at high water; current swift.

Discharge measurements.—Made by wading.

Winter flow.—Relation of gage height to discharge little affected by ice.

Diversions.—Total diversions above the gage amount to about 25 second-feet.

Accuracy.—Results fair.

Discharge measurements of Mission Creek near St. Ignatius, Mont., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 4	Raymond Richards	2.30	29	June 12[a]	W. A. Lamb	3.80	228
				July 4	B. E. Jones	3.56	226
1911.				8	.....do	3.70	241
Jan. 15	B. E. Jones	2.04	12.7	Aug. 2	W. A. Lamb	3.06	87
Mar. 26	.....do	2.08	14.0	4	.....do	3.08	91
Apr. 19	W. A. Lamb	2.05	11.9	Sept. 20	.....do	2.89	46.8

[a] Measurement made from bridge 2 miles above gage.

Daily gage height, in feet, of Mission Creek near St. Ignatius, Mont., for the year ending Sept. 30, 1911.

[Annie Booke, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		2.3						2.30	2.70	3.60	3.10	2.90
2					2.05	1.90		2.30	3.40		3.10	
3		2.3				1.90	2.10	2.30	3.60	3.70	3.10	
4								2.40		3.60	3.10	3.00
5			2.2				2.10	2.40		3.70	3.10	3.00
6		2.3	2.2		2.05		2.10	2.80		3.70	3.10	3.00
7							2.00	2.70		3.70	3.10	2.90
8		2.3		2.10	2.05		2.00	2.60		3.70	3.10	2.90
9			2.15		2.05			2.55				2.90
10			2.15	2.10			2.05	2.50		3.40	3.10	
11		2.4						2.45	3.40	3.40	3.10	2.90
12	2.3	2.4		2.10	2.00			2.40	3.90	3.40	3.10	2.90
13			2.15	2.00			2.00	2.40	4.20	3.40		
14			2.15	2.00	2.00		2.00	2.40	4.05		3.05	2.90
15	2.3	2.3	2.15					2.40	4.00		3.05	2.90
16				2.10	2.00		2.00		3.80	3.30		2.90
17		2.3	2.1	2.10	2.00				3.80	3.30	3.00	
18	2.3	2.3					2.05	2.70		3.25	3.00	2.90
19		2.3	2.1	2.10			2.08	2.70	3.70	3.25	3.00	2.90
20	2.3		2.1	2.08			2.10		3.80	3.20		2.90
21	2.3	2.3	2.1	2.08			2.10	2.60	3.70	3.20	3.00	2.90
22	2.3	2.3	2.1				2.10		3.90	3.20		2.90
23	2.3	2.3		2.08				2.40	4.15	3.10	2.95	2.90
24	2.3	2.3					2.20	2.40	4.30	3.10		
25		2.3					2.20		4.10	3.10	2.90	2.90
26				2.05			2.20	2.40	3.80	3.05	2.90	
27			2.1	2.05	2.00		2.25	2.40	4.10	3.05		2.90
28	2.35		2.1	2.05	1.80		2.30		4.60	3.05	2.90	2.90
29			2.1				2.30	2.38	4.00	3.05	2.90	2.90
30	2.3			2.05					3.70		2.90	2.90
31	2.3		2.1	2.05							2.90	

NOTE.—Low gage height Feb. 28, probably due to effect of ice.

Daily discharge, in second-feet, of Mission Creek near St. Ignatius, Mont., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	26	28	24	16	13	6	16	29	70	228	100	58
2	26	28	24	16	13	5	16	29	166	235	92	60
3	26	28	23	16	13	5	16	29	196	243	92	62
4	26	28	23	16	13		16	38	193	228	92	66
5	26	28	22	16	13		16	38	190	243	92	66
6	27	28	22	16	13		16	82	186	243	92	66
7	27	28	21	16	13		10	70	182	243	92	54
8	27	28	21	16	13		10	58	178	243	92	54
9	27	30	20	16	13		12	53	174	220	90	54
10	27	33	20	16	12		13	48	170	198	88	54
11	27	36	20	16	11		12	43	166	188	88	54
12	28	36	20	16	10		11	38	244	188	88	54
13	28	33	20	10	10		10	38	300	188	86	54
14	28	30	20	10	10		10	38	277	180	83	54
15	28	28	20	13	10		10	38	268	172	83	48
16	28	28	18	16	10		10	50	237	164	79	48
17	28	28	17	16	10		12	60	237	164	75	48
18	28	28	17	16	10		13	70	232	156	75	48
19	28	28	17	16	10		15	70	228	150	75	48
20	28	28	17	15	10		16	64	244	142	75	48
21	28	28	17	15	10		16	58	228	142	75	48
22	28	28	17	15	10		16	48	260	142	70	48
23	28	28	17	15	10		19	38	300	122	64	48
24	28	28	17	14	10		22	38	328	122	61	48
25	29	28	17	14	10		22	38	300	122	58	48
26	30	27	17	13	10		22	38	252	112	58	48
27	31	26	17	13	10		26	38	300	105	58	48
28	32	26	17	13	8		29	37	380	105	58	48
29	30	25	17	13			29	36	284	105	58	48
30	28	25	17	13			29	47	236	105	58	48
31	28		17	13				58		104	58	

NOTE.—Discharge determined from several curves through the discharge measurements, and by shifting channel methods used between curves. Discharge interpolated for short periods for which gage heights are missing. Discharge Feb. 28 estimated because of ice.

Monthly discharge of Mission Creek near St. Ignatius, Mont., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	32	26	27.9	1,720	B.
November	36	25	28.6	1,700	B.
December	24	17	19.1	1,170	B.
January	16	10	14.7	904	B.
February	13	8	11.0	611	B.
April	29	10	16.3	970	B.
May	82	29	47.0	2,890	B.
June	380	70	234.	13,900	B.
July	243	104	171.	10,500	B.
August	100	58	77.6	4,770	B.
September	66	48	52.6	3,130	B.

DRY CREEK NEAR ST. IGNATIUS, MONT.

Location.—At Felsman's ranch, about 1½ miles below St. Marys Lake, above the only tributary and about 5 miles southeast of St. Ignatius.

Records available.—April 16, 1908, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Staff nailed to tree on left bank.

Channel.—Coarse gravel and bowlders; practically permanent.

Discharge measurements.—Made by wading.

Winter flow.—No flow at gage during winter and early spring.

Diversions.—One small ditch diverts above the station.

Accuracy.—Results fair.

Discharge measurements of Dry Creek near St. Ignatius, Mont., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 4	Raymond Richards		0.0	June 11	W. A. Lamb	0.92	35
				July 1	B. E. Jones	1.20	57
1911.				Aug. 1	W. A. Lamb	0.67	18.8
Apr. 18	W. A. Lamb		([a])				

[a] No water at gage.

Daily gage height, in feet, and discharge, in second-feet, of Dry Creek near St. Ignatius, Mont., for the year ending Sept. 30, 1911.

[Henry Felsman, observer.]

Day.	May.		June.		July.		August.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	....	....	0.30	4	1.40	78	0.70	20
2	....	....	.70	20	1.40	78	.70	20
3	....	....	.80	26	1.40	78	.60	15
4	....	....	.90	33	1.30	67	.40	7
5	....	....	1.00	40	1.30	67	.30	4
6	0.40	7	.80	26	1.30	67	.40	7
7	.40	7	.90	33	1.30	67	.60	15
8	.40	7	1.00	40	1.30	67	.50	11
9	.40	7	1.00	40	1.10	48	.40	7
10	.50	11	1.00	40	.90	33	.30	4
11	.30	4	1.10	48	.90	33	.30	4
12	.20	2	1.30	67	.90	33	.30	4
13	.20	2	1.80	125	.90	33	.30	4
14	.20	2	1.95	144	.90	33	.30	4
15	.40	7	2.00	150	.90	33	.30	4
16	.30	4	1.70	113	.90	33	.30	4
17	.30	4	1.70	113	.90	33	.30	4
18	.30	4	1.50	89	.90	33	.30	4
19	.30	4	1.50	89	.90	33	.30	4
20	.40	7	1.50	89	.90	33	.20	2
21	.30	4	1.50	89	.90	33	.20	2
22	.30	4	1.50	89	.90	33	.20	2
23	.30	4	1.70	113	.90	33	....	0
24	.20	2	2.00	150	.85	30	....	0
25	.30	4	1.70	113	.85	30	....	0
26	.30	4	1.50	89	.80	26	....	0
27	.10	1	1.50	89	.80	26	....	0
28	.10	1	1.50	89	.70	20	....	0
29	.10	1	1.50	89	.70	20	....	0
30	....	0	1.40	78	.70	20	....	0
31	....	0	....	....	.70	20	....	0

NOTE.—Stream was dry Aug. 1, 1910, to May 6, 1911, and Aug. 23 to Sept. 30, 1911. Discharge determined from a rating curve well defined between 18 and 100 second-feet.

Monthly discharge of Dry Creek near St. Ignatius, Mont., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
May 6-31	11	0	4.0	206	C.
June	150	4	77.2	4,590	B.
July	78	20	41.0	2,520	B.
August	20	0	4.9	301	C.

POST CREEK NEAR RONAN,[1] MONT.

Location.—Near the house of J. G. Fitzpatrick, about 8 miles southeast of Ronan and about 10 miles north of St. Ignatius, about 2 miles above mouth of North Fork of Post Creek. On March 26, 1911, a new gage was installed at Deschamps's ranch, just above the mouth of North Fork.

Records available.—September 21, 1906, to May 9, 1911, at Fitzpatrick's ranch; at Deschamps's ranch April 20 to November 11, 1911, when station was discontinued.

Drainage area.—Not measured.

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[1] Described as "near St. Ignatius" in report for 1909, as observer obtained his mail at that post office.

Gage.—Staff gages used at both sites.

Channel.—At Fitzpatrick's ranch the stream flows in two channels. At Deschamps's ranch the channel is gravel, and shifts.

Discharge measurements.—Made by wading or from a wagon bridge.

Winter flow.—Affected by ice to some extent.

Diversions.—Two small ditches divert above the gage at Fitzpatrick's ranch.

Accuracy.—Records fair at both sites.

Discharge measurements of Post Creek near Ronan, Mont., in the period Jan. 1, 1911, to Nov. 22, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
	At Fitzpatrick ranch.				*At Deschamps ranch.*		
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 14[a]	B. E. Jones	1.19	23	June 12	W. A. Lamb	2.32	336
Mar. 24	.....do	1.20	31	July 5	B. E. Jones	1.94	249
				Aug. 2	W. A. Lamb	1.24	108
	At Deschamps ranch.			Sept. 18	.....do	.44	38
				Nov. 22	B. E. Jones	.29	29
Mar. 26	B. E. Jones	.83	24				
Apr. 19[b]	W. A. Lamb	.69	22.9				

[a] Frozen at gage.

[b] Driftwood cleared from channel below gage; gage reading before, 0.90; after, 0.69.

Daily gage height, in feet, of Post Creek at Fitzpatrick's ranch, near Ronan, Mont., for the year ending Sept. 30, 1911.

[R. G. Fitzpatrick, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.
1	1.20	1.30	1.20	1.15	1.15	1.15	1.25	1.4
2	1.15	1.25	1.20	1.15	1.15	1.15	1.25	1.4
3	1.20	1.30	1.25	1.15	1.15	1.15	1.25	1.45
4	1.15	1.25	1.20	1.15	1.15	1.15	1.25	1.45
5	1.25	1.30	1.25	1.1	1.15	1.15	1.2	1.45
6	1.20	1.25	1.20	1.15	1.15	1.15	1.2	1.6
7	1.20	1.25	1.20	1.2	1.15	1.15	1.15	1.7
8	1.25	1.40	1.25	1.2	1.15	1.1	1.15	1.6
9	1.20	1.40	1.20	1.2	1.15	1.1	1.15	1.5
10	1.25	1.50	1.25	1.15	1.15	1.1	1.15	....
11	1.20	1.50	1.20	1.2	1.15	1.1	1.15	....
12	1.20	1.60	1.15	1.2	1.15	1.05	1.15	....
13	1.25	1.65	1.20	1.15	1.15	1.05	1.15	....
14	1.20	1.60	1.15	1.15	1.15	1.1	1.15	....
15	1.25	1.60	1.15	1.1	1.15	1.1	1.15	....
16	1.20	1.50	1.10	1.15	1.15	1.15	1.15	....
17	1.20	1.50	1.10	1.15	1.15	1.15	1.15	....
18	1.25	1.45	1.15	1.15	1.15	1.15	1.2	....
19	1.20	1.30	1.10	1.15	1.15	1.15	1.2	....
20	1.25	1.35	1.15	1.1	1.15	1.15	1.2	....
21	1.20	1.25	1.10	1.15	1.15	1.2	1.25	....
22	1.20	1.25	1.10	1.15	1.15	1.2	1.25	....
23	1.25	1.25	1.15	1.15	1.15	1.2	1.3	....
24	1.20	1.20	1.10	1.15	1.15	1.2	1.35	....
25	1.25	1.25	1.15	1.1	1.15	1.2	1.4	....
26	1.30	1.20	1.10	1.15	1.15	1.2	1.4	....
27	1.30	1.20	1.10	1.15	1.15	1.2	1.4	....
28	1.35	1.25	1.15	1.15	1.15	1.25	1.4	....
29	1.30	1.20	1.10	1.15	....	1.25	1.4	....
30	1.35	1.25	1.15	1.1	....	1.25	1.4	....
31	1.30	....	1.10	1.15	....	1.25	....	....

NOTE.—Relation between gage height and discharge affected by ice Jan. 1 to about Mar. 7.

Daily discharge, in second-feet, of Post Creek at Fitzpatrick's ranch, near Ronan, Mont., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.
1	35	45	35	20	20	20	37	54
2	31	40	35	20	20	20	37	54
3	35	45	40	20	20	20	37	62
4	31	40	35	20	20	20	37	62
5	40	45	40	16	20	20	32	62
6	35	40	35	20	20	20	32	86
7	35	40	35	24	20	20	28	105
8	40	56	40	24	20	20	28	86
9	35	56	35	24	20	20	28	69
10	40	69	40	20	20	20	28	....
11	35	69	35	24	20	20	28	....
12	35	86	31	24	20	20	28	....
13	40	96	35	20	20	20	28	....
14	35	86	31	20	20	23	28	....
15	40	86	31	16	20	23	28	....
16	35	69	27	20	20	28	28	....
17	35	69	27	20	20	28	28	....
18	40	62	31	20	20	28	32	....
19	35	45	27	20	20	28	32	....
20	40	50	31	16	20	28	32	....
21	35	40	27	20	20	32	37	....
22	35	40	27	20	20	32	37	....
23	40	40	31	20	20	32	42	....
24	35	35	27	20	20	32	48	....
25	40	40	31	16	20	32	54	....
26	45	35	27	20	20	32	54	....
27	45	35	27	20	20	32	54	....
28	50	40	31	20	20	37	54	....
29	45	35	27	20	....	37	54	....
30	50	40	31	16	....	37	54	....
31	45	....	27	20	....	37	....	....

NOTE.—Discharge October to Dec. 31 determined from a fairly well-defined curve. Discharge Jan. 1 to Mar. 7 determined from a curve through the measurement of Jan. 14. Discharge Mar. 8 to 11 estimated; discharge Mar. 12 to May 9 determined from a rating curve well defined above 27 second-feet.

Monthly discharge of Post Creek at Fitzpatrick's ranch, near Ronan, Mont., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	50	31	38.5	2,370	B.
November	96	35	52.5	3,120	B.
December	40	27	31.9	1,960	B.
January	24	16	20.0	1,230	B.
February	20	20	20.0	1,110	B.
March	37	20	26.4	1,620	B.
April	54	28	36.8	2,190	A.
May 1-9	105	54	71.1	1,270	A.
The period	....	....	....	14,900	

Daily gage height, in feet, of Post Creek at Deschamps's ranch, near Ronan, Mont., for the period Apr. 20, to Nov. 11, 1911.

[Rosa Deschamp, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	....	0.9	1.3	2.15	1.35	0.65	0.35	0.35
2	....	.9	1.85	2.15	1.35	.65	.35	.35
3	....	.9	2.15	2.05	1.35	.65	.35	.35
4	....	1.0	2.3	1.95	1.15	.65	.55	.35
5	....	1.2	2.05	1.85	1.15	.6	.55	.35
6	....	1.5	1.75	1.85	1.35	.6	.55	.35
7	....	1.45	1.8	2.05	1.35	.75	.55	.35
8	....	1.2	2.05	1.95	1.35	.65	.45	.35
9	....	1.2	....	1.65	1.35	.65	.45	.35
10	....	1.1	....	1.35	1.15	.65	.45	.35
11	....	1.05	....	1.35	1.15	.65	.35	.35
12	....	1.0	....	1.35	1.15	.65	.35	....
13	....	1.0	2.35	1.65	1.15	.35	.35	....
14	....	1.0	2.85	1.85	1.15	.35	.35	....
15	....	1.0	2.85	1.75	.85	.35	.35	....
16	....	1.15	2.35	1.65	.85	.35	.35	....
17	....	1.2	2.35	1.65	1.05	.35	.45	....
18	....	1.2	2.35	1.55	1.05	.35	.45	....
19	....	1.2	....	1.55	1.05	.35	.45	....
20	0.6	1.1	2.35	1.55	.95	.35	.45	....
21	.65	1.1	2.35	1.55	.95	.35	.45	....
22	.7	1.1	2.35	1.55	.85	.35	.45	....
23	.9	1.1	2.35	1.55	.85	.35	.45	....
24	.95	....	2.45	1.55	.65	.35	.35	....
25	.95	1.1	2.95	1.55	.65	.35	.35	....
26	1.0	1.2	2.55	1.55	.65	.35	.35	....
27	1.0	1.15	....	1.55	.65	.35	.35	....
28	1.0	1.1	....	1.55	.65	.35	.35	....
29	1.0	1.05	....	1.35	.65	.35	.35	....
30	.9	1.05	....	1.35	.65	.35	.35	....
31	....	1.0	....	1.35	.65	....	.35	....

Daily discharge, in second-feet, of Post Creek at Deschamps's ranch, near Ronan, Mont., for the period Apr. 20, to Nov. 11, 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	....	44	97	294	128	52	32	32
2	....	44	204	294	128	52	32	32
3	....	44	284	268	128	52	32	32
4	....	55	329	243	101	52	44	32
5	....	81	256	220	101	48	44	32
6	....	131	181	220	128	48	44	32
7	....	122	192	268	128	60	44	32
8	....	81	256	243	128	52	38	32
9	....	81	274	178	128	52	38	32
10	....	67	292	128	101	52	38	32
11	....	61	310	128	101	52	32	32
12	....	55	328	128	101	52	32	....
13	....	55	345	178	101	32	32	....
14	....	55	510	220	101	32	32	....
15	....	55	510	198	68	32	32	....
16	....	74	345	178	68	32	32	....
17	....	81	345	178	89	32	38	....
18	....	81	345	160	89	32	38	....
19	....	81	345	160	89	32	38	....
20	16	67	345	160	78	32	38	....
21	20	67	345	160	78	32	38	....
22	24	67	345	160	68	32	38	....
23	44	67	345	160	68	32	38	....
24	50	67	376	160	52	32	32	....
25	50	67	546	160	52	32	32	....
26	55	81	408	160	52	32	32	....
27	55	74	386	160	52	32	32	....
28	55	67	363	160	52	32	32	....
29	55	61	340	128	52	32	32	....
30	44	61	317	128	52	32	32	....
31	....	55	....	128	52	....	32	....

NOTE.—Daily discharge computed from two rating curves as follows: Apr. 20 to June 26, fairly well defined; July 1 to Nov. 11, well defined. Discharge interpolated for days for which gage heights are missing.

Monthly discharge of Post Creek at Deschamps's ranch, near Ronan, Mont., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April 20-30	55	16	42.5	927	B.
May	131	44	69.3	4,260	B.
June	546	97	329	19,600	B.
July	294	128	184	11,300	A.
August	128	52	87.5	5,380	A.
September	60	32	40.0	2,380	A.
October	44	32	35.5	2,180	A.
November 1-11	32	32	32.0	698	A.
The period				44,300	

JOCKO RIVER NEAR JOCKO, MONT.

Location.—At a highway bridge about 1¼ miles northwest of the Jocko Agency.

Records available.—August 20, 1908, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Staff attached to middle pier of bridge.

Channel.—Practically permanent at ordinary stages.

Discharge measurements.—Made by wading from the highway bridge or from foot log.

Winter flow.—Not seriously affected by ice.

Diversions.—Jocko canal diverts about 2 miles above the station; Big Knife canal diverts from Big Knife Creek, and Indian ditch diverts from East Finley Creek. Several other small ditches divert from Jocko River and tributaries.

Accuracy.—Rating curve well defined; records excellent except for lack of daily gage heights.

Discharge measurements of Jocko River near Jocko, Mont., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 7	Raymond Richards	6.88	67	Apr. 29	W. A. Lamb	8.16	308
1911.				June 15	.....do	8.96	964
Jan. 11[a]	B. E. Jones	6.7	18	July 3	B. E. Jones	8.40	456
Mar. 23	.....do	7.25	111	Aug. 5	W. A. Lamb	7.32	120

[a] Ice conditions.

Daily gage height, in feet, of Jocko River near Jocko, Mont., for the year ending Sept. 30, 1911.

[Tony Delaware, observer.]

Day.	Oct.	Nov.	Apr.	May.	June.	July.	Aug.	Sept.
1	6.82			8.00				7.15
2		7.12			8.90			
3	6.82					8.40		
4							7.25	7.35
5	6.88	7.13		8.50	8.75		7.30	
6								
7		7.09	7.20			8.25	7.40	
8	6.86			8.35				7.30
9		7.15			8.70			
10	6.78		7.35					
11							7.40	7.20
12	6.75	7.41		8.15	8.95			
13								
14		7.30	7.25			7.75	7.30	
15	6.73			8.25	8.95			7.20
16		7.21			8.85			
17	6.73		7.30			7.65		
18								7.25
19	6.82	7.14		8.35	8.60		7.30	
20								
21		7.16	7.65			7.50	7.30	
22	6.74			8.25				7.30
23		7.15						
24	6.74		8.05		8.75	7.40		
25								7.20
26	7.37	7.18		8.25	8.65		7.35	
27								
28		7.06	8.25	8.15		7.30	7.20	
29	7.00		8.15					7.15
30		7.04			8.55			
31	7.00					7.20		

Daily discharge, in second-feet, of Jocko River near Jocko, Mont., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Apr.	May.	June.	July.	Aug.	Sept.
1	61	88	80	280	763	519	104	96
2	61	96	85	339	870	487	106	106
3	61	96	90	398	816	455	108	116
4	64	97	95	457	764	437	110	126
5	67	97	100	515	712	418	118	124
6	67	94	100	486	700	399	126	122
7	66	92	103	458	689	380	134	120
8	65	96	110	430	677	352	134	118
9	61	100	118	407	665	328	134	113
10	57	115	126	383	755	304	134	108
11	55	130	122	359	845	280	134	103
12	54	146	118	335	935	256	128	103
13	53	136	114	350	935	232	123	103
14	52	125	110	365	935	208	118	103
15	52	118	113	380	935	200	118	103
16	52	110	116	392	815	192	118	105
17	52	106	118	404	739	184	118	108
18	56	102	134	417	662	176	118	110
19	61	99	150	430	585	168	118	112
20	59	100	167	414	610	160	118	114
21	56	102	184	397	635	152	118	116
22	53	101	222	380	660	146	120	118
23	53	100	260	380	686	140	122	113
24	53	102	298	380	712	134	124	108
25	96	104	318	380	668	130	125	103
26	138	105	338	380	625	126	126	102
27	119	96	359	358	607	122	115	100
28	100	88	380	335	588	118	103	98
29	80	86	335	442	569	113	102	96
30	80	85	308	549	550	108	100	103
31	80			656		103	98	

NOTE.—Discharge for 1911 determined from a fairly well defined curve; for 1912 from a well defined curve. Discharge interpolated for days for which gage heights are missing. Mean discharge December, January, February, and March estimated from discharge measurements and by comparisons with other stations.

Monthly discharge of Jocko River near Jocko, Mont., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	138	52	67.2	4,130	B.
November	146	85	104	6,190	B.
December	....	....	75	4,610	D.
January	....	....	60	3,690	D.
February	....	....	55	3,060	D.
March	....	....	80	4,920	D.
April	380	80	176	10,500	B.
May	656	280	408	25,100	B.
June	935	550	724	43,100	B.
July	519	103	243	14,900	B.
August	134	98	118	7,260	B.
September	126	96	109	6,490	B.
The year	935	....	185	134,000	

NOTE.—See note to daily discharge table.

JOCKO RIVER AT RAVALLI, MONT.

Location.—400 feet from the railroad station at Ravalli.

Records available.—October 18, 1906, to April 8, 1911, when station was discontinued.

Drainage area.—Not measured.

Gage.—Chain gage on right bank used after February 1, 1911. Previous to this date a staff gage at different location and datum.

Channel.—Practically permanent at ordinary stages.

Discharge measurements.—Made by wading or from a highway bridge about three-fourths mile above the gage.

Winter flow.—Only slightly affected by ice.

Diversions.—See Jocko River near Jocko.

Accuracy.—Results good.

Discharge measurements of Jocko River at Ravalli, Mont., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*
Oct. 3	B. E. Jones	1.82	150
1911.			
Jan. 10	.....do	[a] 2.17	120
Mar. 22	.....do	[b] 2.28	145

[a] Old gage read 1.66 feet.

[b] Old gage read 1.79 feet.

Daily gage height, in feet, of Jocko River at Ravalli, Mont., for the year ending Sept. 30, 1911.

[G. D. Pendray, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
1	1.85	1.95	1.85	1.55	2.25	2.10	2.40
2	1.85	1.95	1.85	1.95	2.20	2.10	2.50
3	1.85	1.95	1.85	1.65	2.15	2.10	2.50
4	1.85	1.95	1.85	1.65	2.10	2.05	2.50
5	1.85	1.95	1.85	1.65	2.15	2.10	2.50
6	1.85	1.95	1.85	1.65	2.15	2.10	2.50
7	1.85	1.95	1.85	1.65	2.10	2.20	2.40
8	1.85	1.95	1.85	1.65	2.15	2.35	2.40
9	1.85	1.95	1.85	1.65	2.05	2.20	....
10	1.85	1.95	1.85	1.65	2.10	2.20	....
11	1.95	1.95	1.75	1.65	2.15	2.25	....
12	1.95	2.05	1.75	1.65	2.10	2.10	....
13	1.95	2.05	1.75	1.65	2.15	2.15	....
14	1.95	2.05	1.75	1.65	2.10	2.10	....
15	1.95	1.95	1.75	1.65	2.15	2.15	....
16	1.95	1.95	1.75	1.55	2.10	2.15	....
17	1.95	1.95	1.75	1.55	2.05	2.10	....
18	1.85	1.95	1.75	1.55	2.10	2.15	....
19	1.85	1.95	1.75	1.55	2.05	2.10	....
20	1.85	1.95	1.75	1.65	2.10	2.20	....
21	1.85	1.95	1.75	1.65	2.10	2.25	....
22	1.95	1.95	1.65	1.65	2.05	2.30	....
23	1.95	1.95	1.65	1.65	2.10	2.30	....
24	1.95	1.95	1.75	1.65	2.05	2.40	....
25	1.95	1.95	1.65	1.65	2.15	2.35	....
26	2.15	1.95	1.75	1.65	2.10	2.35	....
27	1.95	1.85	1.75	1.55	2.05	2.35	....
28	1.95	1.85	1.75	1.55	2.10	2.30	....
29	1.85	1.85	1.75	1.55	....	2.30	....
30	1.85	1.85	1.75	1.55	....	2.30	....
31	1.85	....	1.75	1.75	....	2.35	....

NOTE.—Gage heights beginning Feb. 1 were read on chain gage.

Daily discharge, in second-feet, of Jocko River at Ravalli, Mont., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
1	167	192	167	100	138	107	175
2	167	192	167	110	127	107	200
3	167	192	167	120	117	107	200
4	167	192	167	120	107	98	200
5	167	192	167	120	117	107	200
6	167	192	167	120	117	107	200
7	167	192	167	120	107	127	175
8	167	192	167	120	117	162	175
9	167	192	167	120	98	127	....
10	167	192	167	120	107	127	....
11	192	192	142	120	117	138	....
12	192	220	142	120	107	107	....
13	192	220	142	120	117	117	....
14	192	220	142	120	107	107	....
15	192	192	142	120	117	117	....
16	192	192	142	100	107	117	....
17	192	192	142	100	98	107	....
18	167	192	142	100	107	117	....
19	167	192	142	100	98	107	....
20	167	192	142	120	107	127	....
21	167	192	142	120	107	138	....
22	192	192	120	120	98	150	....
23	192	192	120	120	107	150	....
24	192	192	142	120	98	175	....
25	192	192	120	120	117	162	....
26	250	192	142	120	107	162	....
27	192	167	142	100	98	162	....
28	192	167	142	100	107	150	....
29	167	167	142	100	....	150	....
30	167	167	142	100	....	150	....
31	167	....	142	140	....	162	....

NOTE.—Daily discharge determined from two fairly well defined curves, one applicable to readings on the staff gage and the other to readings on the chain gage.

Monthly discharge of Jocko River at Ravalli, Mont., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	250	167	180	11,100	B.
November	220	167	191	11,400	B.
December	167	120	148	9,100	B.
January	140	100	114	7,010	B.
February	138	98	110	6,110	B.
March	175	98	131	8,060	B.
April 1-8	200	175	191	3,030	B.
The period				55,800	

BIG KNIFE CREEK NEAR JOCKO, MONT.

Location.—Just above the head gates of the Big Knife canal, about 2½ miles northeast of Jocko. The station was located about 1 mile below the present site previous to the construction of the Big Knife canal. This canal was put in operation on August 1, 1910.

Records available.—August 5, 1910, to September 30, 1911; August 19, 1908, to December 31, 1910, at old station.

Drainage area.—Not measured.

Gage.—Staff.

Channel.—Slightly shifting.

Discharge measurements.—Made by wading.

Winter flow.—Only slightly affected by ice.

Diversion.—No diversions above the station. Big Knife canal diverts just below the station.

Accuracy.—Results good.

Discharge measurements of Big Knife Creek near Jocko, Mont., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 7	Richards and Jones	2.03	7.2	Apr. 29	W. A. Lamb	2.02	6.4
				June 15	do	2.94	40.0
1911.				July 3	B. E. Jones	2.70	28.2
Jan. 11	B. E. Jones	1.90	5.0	Aug 5	W. A. Lamb	2.42	17.2
Mar. 23	do	1.85	4.7				

Daily gage height, in feet, of Big Knife Creek near Jocko, Mont., for the year ending Sept. 30, 1911.

[Tony Delaware, observer.]

Day.	Oct.	Nov.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.04			1.95				2.24
2					2.62			
3	2.06	2.00				2.70		
4							2.42	2.30
5	2.04	1.98		2.03	2.73		2.42	
6								
7		1.97				2.60	2.40	
8	2.02			2.11				2.26
9		1.98			2.70			
10	2.02		1.84					
11							2.35	2.24
12	2.02	2.02		2.06	2.89			
13								
14		2.00	1.84			2.53	2.32	
15	2.01			2.13	2.94			2.24
16		1.99			2.88			
17	2.02		1.83			2.50		
18								2.22
19	2.03	1.97		2.23	2.79		2.30	
20								
21		1.97	1.84			2.48	2.30	
22	2.00			2.16				2.22
23		1.97						
24	1.99		1.92		2.86	2.46		
25								2.19
26	2.00	1.94		2.17	2.75		2.29	
27								
28		1.94	1.92	2.14		2.40	2.26	
29	1.99		2.02					2.17
30		1.94			2.76			
31	1.99					2.42		

Daily discharge, in second-feet, of Big Knife Creek near Jocko, Mont., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Apr.	May.	June.	July.	Aug.	Sept.
1	7.0	6.2	4.4	5.6	21	30	16	11
2	7.2	6.3	4.4	5.9	24	29	16	11
3	7.3	6.3	4.4	6.2	26	28	16	12
4	7.2	6.2	4.4	6.5	28	27	16	12
5	7.0	6.0	4.4	6.8	30	26	16	12
6	6.9	6.0	4.4	7.2	30	25	16	12
7	6.7	5.9	4.4	7.7	29	23	16	12
8	6.6	6.0	4.4	8.2	28	23	15	12
9	6.6	6.0	4.4	8.0	28	22	14	12
10	6.6	6.2	4.4	7.8	31	22	14	11
11	6.6	6.4	4.4	7.5	35	21	14	11
12	6.6	6.6	4.4	7.3	38	21	14	11
13	6.6	6.4	4.4	7.7	39	20	13	11
14	6.5	6.3	4.4	8.1	40	20	13	11
15	6.5	6.2	4.4	8.6	40	20	13	11
16	6.6	6.2	4.3	9.2	37	19	13	11
17	6.6	6.1	4.3	9.8	36	19	12	10
18	6.7	6.0	4.3	10	34	19	12	10
19	6.8	5.9	4.4	11	32	18	12	10
20	6.6	5.9	4.4	10	32	18	12	10
21	6.4	5.9	4.4	9.8	33	18	12	10
22	6.3	5.9	4.7	9.2	34	18	12	10
23	6.2	5.9	5.0	9.3	35	18	12	10
24	6.2	5.8	5.3	9.3	36	18	12	10
25	6.2	5.6	5.3	9.3	33	18	12	10
26	6.3	5.5	5.3	9.4	30	18	12	9.8
27	6.3	5.5	5.3	9.1	30	17	12	9.7
28	6.2	5.5	5.3	8.8	30	16	12	9.6
29	6.2	5.5	6.6	12	31	16	12	9.4
30	6.2	5.5	6.1	15	31	16	12	9.6
31	6.2			18		16	12	

NOTE.—Daily discharge determined from a well-defined rating curve. Discharge interpolated for days for which gage heights are missing. Monthly mean for December, January, February, and March estimated from discharge measurements and by comparisons with records of other stations.

Monthly discharge of Big Knife Creek near Jocko, Mont., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	7.3	6.2	6.58	405	B.
November	6.6	5.5	5.99	356	B.
December			5.00	307	D.
January			5.00	307	D.
February			4.00	222	D.
March			4.70	289	D.
April	6.6	4.3	4.70	280	C.
May	18	5.6	8.98	552	B.
June	40	21	32.0	1,900	B.
July	30	16	20.6	1,270	B.
August	16	12	13.4	824	B.
September	12	9.4	10.7	637	B.
The year	40		10.2	7,350	

AGENCY CREEK NEAR JOCKO, MONT.

Location.—Just above the intake of the Matt ditch, about 2 miles east of Jocko.

Records available.—August 19, 1908, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Staff.

Channel.—Slightly shifting.

Discharge measurements.—Made by wading.

Winter flow.—Only slightly affected by ice.

Diversions.—The Matt ditch is the largest leaving the stream; smaller ditches take water below the station.

Accuracy.—Results good.

Discharge measurements of Agency Creek near Jocko, Mont., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 7	Raymond Richards	0.67	4.8	Apr. 29	W. A. Lamb	0.92	11.6
				May 30	.....do	1.48	23
1911.				June 14	.....do	2.50	68
Jan. 11[a]	B. E. Jones	.57	5.3	July 3	B. E. Jones	1.65	31.3
Mar. 23	.....do	.56	3.6	Aug. 5	W. A. Lamb	.90	9.6

[a] Gage height affected by ice.

Daily gage height, in feet, of Agency Creek near Jocko, Mont., for the year ending Sept. 30, 1911.

[Tony Delaware, observer.]

Day.	Oct.	Nov.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.61			0.86				0.72
2					2.05			
3	.66	0.68				1.65		
4							0.93	.87
5	.67	.66		1.50	2.10		.90	
6								
7		.62	0.52			1.55	.90	
8	.66			1.40				.88
9		.63			1.95			
10	.64		.53					
11							.85	.83
12	.63	.82		1.00	2.25			
13								
14		.75	.52		2.50	1.25	.80	
15	.62			1.35				.88
16		.72			2.10			
17	.63		.51			1.15		
18								.75
19	.59	.70		1.40	1.95		.77	
20								
21		.71	.64			1.05	.76	
22	.62			1.15				.77
23		.67						
24	.62		.82		2.05	1.05		
25								.75
26	.64	.63		1.15	1.85		.80	
27								
28		.63	1.00	1.05		.99	.76	
29	.69		.92					.72
30		.62		1.50	1.75			
31	.68					.95		

Daily discharge, in second-feet, of Agency Creek near Jocko, Mont., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Apr.	May.	June.	July.	Aug.	Sept.
1	4.4	5.3	3.2	9.2	38	33	11	6.4
2	4.7	5.3	3.2	13	46	32	11	7.4
3	5.1	5.3	3.2	17	47	30	11	8.4
4	5.2	5.2	3.2	20	47	29	11	9.4
5	5.2	5.1	3.2	24	48	28	10	9.4
6	5.2	4.8	3.2	23	46	27	10	9.5
7	5.1	4.6	3.2	22	45	26	10	9.6
8	5.1	4.6	3.2	21	44	24	10	9.6
9	4.9	4.7	3.3	18	42	23	10	9.2
10	4.8	5.7	3.3	16	46	22	9.0	8.9
11	4.8	6.8	3.3	14	51	21	9.0	8.6
12	4.7	7.8	3.3	12	56	20	8.6	8.8
13	4.7	7.1	3.2	14	62	19	8.3	9.1
14	4.6	6.5	3.2	17	68	17	8.0	9.4
15	4.6	6.3	3.2	20	58	16	7.8	9.6
16	4.6	6.0	3.1	20	48	16	7.7	8.7
17	4.7	5.9	3.1	20	46	15	7.6	7.9
18	4.5	5.7	3.5	21	44	15	7.5	7.0
19	4.2	5.6	3.9	21	42	14	7.4	7.1
20	4.3	5.7	4.4	19	43	13	7.3	7.2
21	4.5	5.8	4.8	17	44	13	7.2	7.3
22	4.6	5.5	6.0	15	45	13	7.4	7.4
23	4.6	5.2	7.2	15	46	13	7.6	7.3
24	4.6	5.0	8.4	15	46	13	7.7	7.2
25	4.7	4.9	9.3	15	42	13	7.8	7.0
26	4.8	4.7	10.0	15	38	12	8.0	6.8
27	5.0	4.7	11.0	14	37	12	7.6	6.7
28	5.3	4.7	12.0	13	36	12	7.2	6.6
29	5.5	4.6	10.0	18	35	12	7.0	6.4
30	5.4	4.6	9.6	24	34	11	6.8	7.1
31	5.3			31		11	6.6	

NOTE.—Daily discharge determined from a fairly well-defined rating curve. Discharge interpolated for days for which gage heights are missing. Mean discharge December to March estimated from discharge measurements and by comparison with records for other stations.

Monthly discharge of Agency Creek near Jocko, Mont., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	5.5	4.2	4.83	297	B.
November	7.8	4.6	5.46	325	B.
December			5.00	307	D.
January			5.30	326	D.
February			4.00	222	D.
March			3.60	221	D.
April	12	3.1	5.16	307	C.
May	31	9.2	17.8	1,090	B.
June	68	34	45.7	2,720	B.
July	33	11	18.5	1,140	B.
August	11	6.6	8.49	522	B.
September	9.6	6.4	8.03	478	B.
The year	68.0		11.0	7,960	

FINLEY CREEK NEAR JOCKO, MONT.

Location.—At a ford about one-eighth mile below junction of East and West forks, 300 feet south of the Northern Pacific Railway, about 3½ miles east of Arlee and 4 miles south of Jocko.

Records available.—August 19, 1908, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Staff nailed to a tree on right bank near the ford.

Channel.—Fairly permanent.

Winter flow.—Slightly affected by ice.

Diversions.—Indian ditch diverts water from East Finley Creek just below the station on that stream. Beginning in August, 1911, a Reclamation Service ditch diverted from East Finley Creek above the gaging station.

Accuracy.—Results good.

Discharge measurements of Finley Creek near Jocko, Mont., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-feet.*
Oct. 7	Raymond Richards	1.28	7.4	Apr. 29	W. A. Lamb	1.50	22
				June 14	do	2.00	105
1911.				July 3	B. E. Jones	1.68	41
Jan. 11	B. E. Jones	1.25	6.1	Aug. 6	W. A. Lamb	1.40	11.7
Mar. 23	do	1.37	11.5				

Daily gage height, in feet, of Finley Creek near Jocko, Mont., for the year ending Sept. 30, 1911.

[Tony Delaware, observer.]

Day.	Oct.	Nov.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.26			1.47				1.30
2					1.90		1.4	
3	1.29	1.29				1.69		
4								1.34
5	1.29	1.28		1.68	2.02			
6								
7		1.28	1.33			1.62	1.40	
8	1.28			1.61				1.35
9		1.29			2.00			
10	1.27		1.34					
11							1.37	1.32
12	1.27	1.34		1.64	2.00			
13								
14		1.32	1.33			1.54	1.34	
15	1.28			1.69				1.31
16		1.31			1.98			
17	1.28		1.32			1.50		
18								1.31
19	1.29	1.30		1.74	1.88		1.33	
20								
21		1.34	1.34			1.47	1.33	
22	1.28			1.69				1.32
23		1.33						
24	1.27		1.43		1.80	1.44		
25								1.30
26	1.29	1.30		1.68	1.74		1.34	
27								
28		1.29	1.53	1.56		1.41	1.31	
29	1.28							1.30
30		1.30			1.72			
31	1.29					1.41		

Daily discharge, in second-feet, of Finley Creek near Jocko, Mont., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Apr.	May.	June.	July.	Aug.	Sept.
1	7.4	8.6	8.8	19	68	44	13	7.0
2	8.0	8.6	8.8	24	79	43	13	7.8
3	8.6	8.6	8.8	29	90	42	13	8.6
4	8.6	8.4	8.8	35	100	39	13	9.4
5	8.6	8.2	8.8	41	110	37	13	9.6
6	8.4	8.2	8.8	38	108	35	13	9.7
7	8.4	8.2	8.8	35	106	33	13	9.8
8	8.2	8.4	9.0	32	105	32	12	10
9	8.0	8.6	9.2	33	104	31	12	9.4
10	7.8	9.0	9.4	34	104	30	12	8.8
11	7.8	10	9.2	35	104	29	11	8.2
12	7.8	11	9.1	36	104	28	10	8.0
13	8.0	10	9.0	38	103	27	10	7.9
14	8.0	10	8.8	40	102	25	9.4	7.8
15	8.2	10	8.6	42	100	24	9.3	7.6
16	8.2	9.5	8.4	44	99	22	9.2	7.6
17	8.2	9.2	8.2	46	91	21	9.0	7.6
18	8.4	9.3	8.5	47	83	20	8.9	7.6
19	8.6	9.0	8.8	49	75	20	8.8	7.8
20	8.4	10	9.1	47	72	20	8.8	7.9
21	8.4	11	9.4	44	69	19	8.8	8.0
22	8.2	10	11	42	66	18	8.9	8.2
23	8.0	10	13	42	63	17	9.0	7.8
24	7.8	10	15	42	59	16	9.2	7.4
25	8.2	9.0	17	41	54	16	9.3	7.0
26	8.6	9.0	19	41	49	15	9.4	7.0
27	8.4	8.8	21	34	48	14	8.5	7.0
28	8.4	8.6	24	27	48	14	7.6	7.0
29	8.2	8.8	22	37	47	14	7.4	7.0
30	8.4	9.0	20	47	46	14	7.2	9.0
31	8.6			57		14	7.1	

NOTE.—Daily discharge determined from a fairly well defined rating curve. Discharge interpolated for days for which gage heights are missing. Mean discharge for January, February, and March estimated from discharge measurements and by comparison with records of other stations.

Monthly discharge of Finley Creek near Jocko, Mont., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	8.6	7.4	8.22	505	B.
November	11	8.2	9.23	549	B.
December					
January			6.10	375	D.
February			8.00	444	D.
March			10.0	615	D.
April	24	8.2	11.6	690	B.
May	57	19	38.6	2,370	B.
June	110	46	81.9	4,870	B.
July	44	14	24.9	1,530	B.
August	13	7.1	10.1	621	B.
September	10	7.0	8.12	483	B.

EAST FINLEY CREEK NEAR JOCKO, MONT.

Location.—Just above the intake of Indian ditch, 4 miles southeast of Jocko, and 4½ miles east of Arlee.

Records available.—August 18, 1908, to July 31, 1911.

Drainage area.—Not measured.

Gage.—Staff.

Channel.—Practically permanent.

Discharge measurements.—Made by wading.

Winter flow.—Affected by ice to a small extent.

Diversions.—Indian ditch, which diverted below the station, took practically the entire low-water flow. After July 31 the entire flow of East Finley Creek was diverted above the gage by a Reclamation Service canal.

Accuracy.—Results good.

Discharge measurements of East Finley Creek near Jocko, Mont., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1910.		*Feet.*	*Sec.-ft.*
Oct. 7	Raymond Richards	1.38	5.5	Apr. 29[a]	W. A. Lamb	1.78	16
				June 14	do	2.37	64
1911.				July 3	B. E. Jones	1.88	26.7
Jan. 11	B. E. Jones	1.24	2.9	Aug. 6[b]	W. A. Lamb	.9	.5
Mar. 23	do	1.26	3.1				

[a] Measured below Indian ditch. Total flow includes 15.4 second-feet in ditch.
[b] Water diverted above gage amounting to 7.2 second-feet.

Daily gage height, in feet, of East Finley Creek near Jocko, Mont., for the year ending Sept. 30, 1911.

[Tony Delaware, observer.]

Day.	Oct.	Nov.	Apr.	May.	June.	July.	Day.	Oct.	Nov.	Apr.	May.	June.	July.
1	1.30	......	......	1.72	......	1.88	16	......	1.44	......	......	2.30	......
2	......	......	......	......	2.43	......	17	1.36	......	1.29	......	......	1.66
3	1.33	1.40	......	......	......	1.88	18	......	......	......	......	......	......
4	......	......	......	......	......	......	19	1.38	1.43	......	1.89	2.10	......
5	1.39	1.38	......	2.22	2.40	......	20	......	......	......	......	......	......
6	......	......	......	......	......	......	21	......	1.42	1.31	......	......	1.61
7	......	1.37	1.30	......	......	1.80	22	1.37	......	......	1.75	......	......
8	1.39	......	......	2.00	......	......	23	......	1.42	......	......	......	......
9	......	1.37	......	......	2.28	......	24	1.37	......	1.49	......	2.16	1.58
10	1.40	......	1.30	......	......	......	25	......	......	......	......	......	......
11	......	......	......	......	......	......	26	1.40	1.40	......	1.78	2.04	......
12	1.39	1.44	......	1.77	2.50	......	27	......	......	......	......	......	......
13	......	......	......	......	......	......	28	......	1.39	1.89	1.71	......	1.55
14	......	1.45	1.30	......	2.37	1.70	29	1.40	......	1.78	......	......	......
15	1.39	......	......	1.85	......	......	30	......	1.37	......	......	1.93	......
							31	1.40	......	......	......	......	1.28

Daily discharge, in second-feet, of East Finley Creek near Jocko, Mont., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Apr.	May.	June.	July.	Day.	Oct.	Nov.	Apr.	May.	June.	July.
1	3.5	5.5	3.4	15	62	24	16	5.0	6.6	3.3	22	58	13
2	3.8	5.5	3.4	23	74	24	17	4.7	6.5	3.3	23	51	13
3	4.1	5.5	3.4	32	73	24	18	4.9	6.4	3.3	24	45	12
4	4.7	5.3	3.4	41	71	23	19	5.1	6.3	3.4	24	39	12
5	5.3	5.1	3.4	50	70	22	20	5.0	6.2	3.5	22	40	11
6	5.3	5.0	3.4	43	66	20	21	4.9	6.0	3.6	19	41	11
7	5.3	4.9	3.4	37	62	19	22	4.9	6.0	4.8	17	42	11
8	5.3	4.9	3.4	31	59	18	23	4.9	6.0	6.1	17	43	10
9	5.4	4.9	3.4	27	56	17	24	4.9	5.9	7.4	18	44	10
10	5.5	5.4	3.4	24	64	16	25	5.2	5.7	12	18	39	9.8
11	5.4	6.0	3.4	21	73	15	26	5.5	5.5	16	18	34	9.5
12	5.3	6.6	3.4	18	82	15	27	5.5	5.4	20	16	32	9.3
13	5.3	6.8	3.4	19	74	14	28	5.5	5.3	24	15	30	9.1
14	5.3	6.9	3.4	20	66	14	29	5.5	5.1	18	26	28	7.1
15	5.3	6.8	3.4	22	62	14	30	5.5	4.9	16	38	27	5.1
							31	5.5	......	......	50	......	3.1

NOTE.—Daily discharge determined from a well-defined curve. Discharges interpolated for days for which gage heights are missing. Mean discharge estimated for December to March from discharge measurements and by comparison with records of other stations.

Monthly discharge of East Finley Creek near Jocko, Mont., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	5.5	3.5	5.07	312	B.
November	6.9	4.9	5.76	343	B.
December	....	....	5.0	307	D.
January	....	....	3.00	184	D.
February	....	....	3.00	167	D.
March	....	....	3.10	191	D.
April	24	3.3	6.52	388	B.
May	50	15	25.5	1,570	B.
June	82	27	53.6	3,190	B.
July	24	3.1	14.0	861	B.
The period	....	....	....	7,510	

INDIAN DITCH NEAR JOCKO, MONT.

Location.—Just below intake and about 50 feet below gage on East Finley Creek. Indian ditch takes water from East Finley Creek. It is about 4 miles long and irrigates land in the vicinity of Jocko Agency.

Records available.—August 18, 1908, to July 31, 1911.

Gage.—Staff located in the flume just below the intake.

Discharge measurements.—Made in the flume or by wading in the ditch.

Diversions.—On July 31 the water in East Finley Creek was diverted into a new ditch built by the Reclamation Service, which heads above the intake of Indian ditch, and also the gage on East Finley Creek. No records were kept on East Finley Creek or Indian ditch after July 31.

Accuracy.—Results fair.

Discharge measurements of Indian ditch near Jocko, Mont., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
1910.				Mar. 23	B. E. Jones	0.30	[a]2.7
Oct. 6	Raymond Richards	0.39	3.6	Apr. 29	W. A. Lamb	.95	15.4
				June 14	do	1.05	16.8
1911.				July 3	B. E. Jones	.91	15.4
Jan. 11	B. E. Jones		[a]2.7	Aug. 6	W. A. Lamb		([b])

[a] Discharge estimated from measurement of East Finley Creek.
[b] No water in ditch.

Daily gage height, in feet, and discharge, in second-feet, of Indian ditch near Jocko, Mont., for the year ending Sept. 30, 1911.

[Tony Delaware, observer.]

Day.	October.		November.		April.		May.		June.		July.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	0.37	3.6		5.1		2.6	0.75	11		19		14
2		3.6		5.1		2.6		15	1.22	22		14
3	.37	3.6	0.43	5.1		2.7		19		20	0.86	13
4		4.4		5.0		2.7		23		18		13
5	.43	5.1	.42	4.8		2.8	1.37	26	1.00	16		12
6		5.1		4.7		2.8		24		16		11
7		5.1	.41	4.6	0.34	2.8		22		15	.76	11
8	.43	5.1		4.4		2.9	1.17	21		15		11
9		5.1	.40	4.3		2.9		17	.90	14		11
10	.43	5.1		4.9	.35	3.0		12		16		11
11		5.0		5.5		3.0		7.0		18		11
12	.42	4.8	.47	6.2		3.0	.30	2.2	1.10	19		11
13		4.8		6.3		3.0		1.5		18		11
14		4.8	.48	6.4	.35	3.0		.7	1.05	18	.75	11
15	.42	4.8		6.3		2.9	.00	.0		16		10
16		4.6	.47	6.2		2.9		.0	.90	14		10
17	.40	4.3		6.1	.34	2.8		.0		13	.70	9.6
18		4.6		6.0		2.9		.0		12		9.3
19	.42	4.8	.46	5.9		3.0	.00	.0	.75	11		9.0
20		4.7		5.8		3.2		3.0		13		8.8
21		4.7	.45	5.6	.37	3.3		6.0		16	.65	8.6
22	.41	4.6		5.6		4.2	.68	9.2		18		8.6
23		4.6	.45	5.6		5.2		9.4		20		8.6
24	.41	4.6		5.5	.53	6.2		9.5	1.25	23	.65	8.6
25		4.8		5.3		8.9		9.7		20		8.1
26	.43	5.1	.43	5.1		12	.71	9.8	1.07	18		7.5
27		5.1		5.1		14		9.9		18		7.2
28		5.1	.43	5.1	1.02	17	.74	10		17	.56	6.8
29	.43	5.1		5.0	.95	15		12		16		5.3
30		5.1	.42	4.8		13		15	.95	15		3.9
31	.43	5.1						17			.32	2.5

NOTE.—Daily discharge determined from a fairly well defined rating curve and interpolated for days for which gage heights are missing.

Monthly discharge of Indian ditch near Jocko, Mont., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	5.1	3.6	4.74	291	C.
November	6.4	4.3	5.38	320	C.
April	17	2.6	5.21	310	C.
May	26	0.0	10.4	640	C.
June	23	11	16.5	982	C.
July	14	2.5	9.59	590	C.

VALLEY CREEK NEAR RAVALLI, MONT.

Location.—Near the mouth of the creek, at the crossing of the highway between Jocko and Ravalli, about 3 miles east of Ravalli and 8 miles west of Arlee.

Records available.—August 20, 1908, to September 30, 1911. (Discharge measurements only during 1911.)

Drainage area.—Not measured.

Gage.—Staff on left bank above the bridge.

Channel.—Likely to shift.

Discharge measurements.—Made by wading.

Winter flow.—Not seriously affected by ice.

Accuracy.—Data inadequate for estimates of discharge.

Discharge measurements of Valley Creek near Ravilli, Mont., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 6	B. E. Jones	1.21	15	Mar. 22	B. E. Jones	1.23	17.2
				June 14	W. A. Lamb	1.88	83
1911.				July 2	B. E. Jones	1.74	57
Jan. 10	B. E. Jones	1.16	12.6				

REVAIS CREEK NEAR DIXON, MONT.

Location.—In T. 18 N., R. 22 W., near the residence of A. Bishop, about 4 miles northwest of Dixon, Mont.

Records available.—April 30 to September 30, 1911.

Drainage area.—Not measured.

Gage.—Staff attached to tree on right bank about 100 feet below a log highway bridge.

Channel.—Narrow, with high banks; bed composed of small bowlders; fairly permanent.

Discharge measurements.—Made by wading or from the bridge.

Winter flow.—Not seriously affected by ice.

Accuracy.—Rating curve well defined above 16 second-feet; records considered good.

Discharge measurements of Revais Creek near Dixon, Mont., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 30	W. A. Lamb	2.23	56	Aug. 7	W. A. Lamb	1.72	18.8
June 16	do	2.55	108	Sept. 17	do	1.61	11.6
July 8	B. E. Jones	2.04	41				

Daily gage height, in feet, and discharge, in second-feet, of Revais Creek near Dixon, Mont., for the year ending Sept. 30, 1911.

[A. Bishop, observer.]

Day.	May.		June.		July.		August.		September.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	2.20	55	2.50	97	2.30	67	1.60	14	1.40	8.0
2	2.20	55	2.80	154	2.30	67	1.60	14	1.40	8.0
3	2.25	61	2.70	133	2.20	55	1.60	14	1.50	11
4	2.35	74	2.70	133	2.20	55	1.60	14	1.60	14
5	2.60	114	2.60	114	2.20	55	1.60	14	1.60	14
6	2.75	144	2.50	97	2.20	55	1.70	18	1.60	14
7	2.60	114	2.65	124	2.20	55	1.70	18	1.60	14
8	2.50	97	2.70	133	2.10	45	1.70	18	1.60	14
9	2.40	81	2.65	124	2.00	36	1.70	18	1.60	14
10	2.30	67	2.65	124	2.00	36	1.70	18	1.60	14
11	2.30	67	2.55	106	2.00	36	1.60	14	1.60	14
12	2.30	67	2.65	124	1.90	29	1.60	14	1.60	14
13	2.30	67	2.70	133	1.90	29	1.60	14	1.60	14
14	2.20	55	2.65	124	1.90	29	1.60	14	1.60	14
15	2.25	61	2.55	106	1.90	29	1.60	14	1.60	14
16	2.45	89	2.50	97	1.90	29	1.60	14	1.60	14
17	2.40	81	2.45	89	1.80	23	1.60	14	1.60	14
18	2.30	67	2.40	81	1.80	23	1.60	14	1.60	14
19	2.30	67	2.30	67	1.80	23	1.60	14	1.60	14
20	2.20	55	2.30	67	1.80	23	1.60	14	1.60	14
21	2.20	55	2.30	67	1.80	23	1.60	14	1.60	14
22	2.20	55	2.20	55	1.70	18	1.60	14	1.60	14
23	2.30	67	2.25	61	1.70	18	1.50	11	1.70	18
24	2.30	67	2.50	97	1.70	18	1.50	11	1.60	14
25	2.20	55	2.60	114	1.70	18	1.50	11	1.60	14
26	2.20	55	2.55	106	1.70	18	1.50	11	1.60	14
27	2.20	55	2.50	97	1.70	18	1.50	11	1.60	14
28	2.10	45	2.40	81	1.70	18	1.50	11	1.60	14
29	2.10	45	2.40	81	1.70	18	1.50	11	1.60	14
30	2.15	50	2.30	67	1.60	14	1.50	11	1.60	14
31	2.25	61	....	....	1.60	14	1.50	11	....	....

NOTE.—Daily discharge determined from a rating curve based on measurements made during 1911 and 1912; curve well defined above about 16 second-feet and fairly well defined below.

Monthly discharge of Revais Creek near Dixon, Mont., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
May	144	45	69.3	4,260	A.
June	154	55	102	6,070	A.
July	67	14	32.1	1,970	A.
August	18	11	13.8	848	B.
September	18	8.0	13.6	809	B.

THOMPSON RIVER NEAR THOMPSON FALLS, MONT.

Location.—In the SE. ¼ sec. 7, T. 21 N., R. 28 W., at the second highway bridge, 1 mile from the mouth of Thompson River and 8 miles east of Thompson Falls.

Records available.—February 12 to September 30, 1911.

Drainage area.—601 square miles.

Gage.—Vertical staff attached to the right-hand downstream side of the center pier.

Channel.—Practically permanent; broken by one pier. Bed of river composed of gravel and small rock.

Discharge measurements.—Made from the highway bridge or by wading at the ford 50 feet above bridge.

Winter flow.—Affected by ice.

Diversion.—A large flume takes water from the river one-half mile above the gage for use in the irrigation of bench lands adjoining Clark Fork between the mouth of Thompson River and Thompson Falls.

Accuracy.—Results good.

Cooperation.—Field data furnished by United States Forest Service.

Discharge measurements of Thompson River near Thompson Falls, Mont., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 13	J. P. Martin	3.85	165
June 21	F. E. Bonner	5.05	912
July 27	.....do	4.30	374
Sept. 23	G. H. Lautz	4.00	244

Daily gage height, in feet, of Thompson River near Thompson Falls, Mont., for the year ending Sept. 30, 1911.

[F. E. Brown, observer.]

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1			4.70			5.10		3.90
2								
3		3.80			5.70			
4								4.18
5						4.85	4.30	4.22
6				5.80		4.80		
7						4.78	4.40	
8			5.40					
9					5.20			
10				5.40	5.20			
11		3.88					4.20	
12	3.85							
13					5.50			
14				5.15			4.10	
15			4.45		5.50	4.50		
16					5.40			4.05
17					5.30	4.50		
18		4.13						
19					5.10		4.20	4.00
20				5.40	5.00	4.40		
21					5.05			
22							4.10	
23								4.00
24			5.40					
25		4.65						
26								
27						4.30		
28					5.30			
29				5.10				
30			5.40					
31								

Daily discharge, in second-feet, of Thompson River near Thompson Falls, Mont., for the year ending Sept. 30, 1911.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1		150	630	1,330	1,330	970	375	190
2		150	720	1,400	1,450	915	375	230
3		150	810	1,470	1,580	860	375	270
4		155	900	1,540	1,490	805	375	315
5		160	990	1,610	1,410	750	375	335
6		165	1,080	1,690	1,330	710	402	328
7		170	1,170	1,590	1,240	694	430	319
8		175	1,260	1,480	1,150	670	400	311
9		180	1,140	1,370	1,060	645	375	303
10		181	1,030	1,260	1,060	615	350	295
11		182	915	1,200	1,160	590	325	287
12	170	200	800	1,140	1,260	565	309	280
13		215	685	1,080	1,360	540	292	273
14		230	570	1,020	1,360	515	275	266
15		245	460	1,060	1,360	490	285	259
16		260	550	1,100	1,260	490	295	252
17		275	640	1,140	1,160	490	305	244
18		290	730	1,180	1,060	470	315	237
19		335	820	1,220	970	450	325	230
20		380	910	1,260	880	430	309	230
21		425	1,000	1,230	925	423	292	230
22		470	1,090	1,200	950	416	275	230
23		515	1,180	1,160	980	408	266	230
24		560	1,260	1,120	1,010	400	257	227
25		595	1,260	1,090	1,050	392	248	225
26		600	1,260	1,060	1,090	383	239	223
27		605	1,260	1,030	1,130	375	231	220
28		610	1,260	1,000	1,160	375	223	217
29		615	1,260	970	1,090	375	214	214
30		620	1,260	1,090	1,030	375	206	211
31		625		1,210		375	198	

NOTE.—Daily discharge determined from a rating curve well defined below 1,500 second-feet. Discharge interpolated for days for which gage heights are missing, March to September. Mean discharge Feb. 12 to 28 estimated.

Monthly discharge of Thompson River near Thompson Falls, Mont., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
February 12-28			165	5,560	D.
March	625	150	338	20,800	B.
April	1,260	460	963	57,300	B.
May	1,690	970	1,240	76,200	B.
June	1,580	880	1,180	70,200	B.
July	970	375	547	33,600	B.
August	430	198	307	18,900	B.
September	335	190	256	15,200	B.
The period				298,000	

PROSPECT CREEK NEAR THOMPSON FALLS, MONT.

Location.—In the NE. ¼ NE. ¼ sec. 18, T. 21 N., R. 29 W., at the first highway bridge over Prospect Creek, above the mouth of Dry Creek, and about 1 mile from Thompson Falls.

Records available.—February 12 to September 30, 1911.

Drainage area.—139 square miles.

Gage.—Vertical staff attached to a pier of the bridge.

Channel.—Large rocks; very rough at low water; probably permanent.

Discharge measurements.—Made by wading 200 feet below the bridge or, during very high water, from the bridge.

Winter flow.—Seriously affected by ice.

Diversion.—None.

Accuracy.—Results fair.

Discharge measurements of Prospect Creek near Thompson Falls, Mont., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 12	E. W. Kramer	2.72	74	July 27	F. E. Bonner	2.90	142
June 20	F. E. Bonner	3.90	396	Sept. 23	G. H. Lautz	2.60	79

Daily gage height, in feet, of Prospect Creek near Thompson Falls, Mont., for the year ending Sept. 30, 1911.

[F. E. Brown, observer.]

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1			5.0		4.2			
2								
3					5.1			2.50
4		2.68			5.1	3.45		
5			4.5					
6								
7								
8				5.3	4.9			
9			3.95		4.7			
10					4.5		2.80	
11		2.75	4.2		4.6	3.20		
12	2.72					3.20		
13								
14			3.90	4.7				2.60
15		2.90						
16		3.30	3.95	5.0			2.75	
17				5.4	4.3			
18		3.70			4.1			
19								
20					3.90			
21				4.9				2.58
22		5.9	5.6					
23		6.1	5.7					2.60
24				5.4	3.95			2.58
25	2.70	4.9				3.00		
26		4.3					2.70	2.55
27		4.2				2.90		
28				3.80				
29						2.90	2.65	
30								
31		4.5						

Daily discharge, in second-feet, of Prospect Creek near Thompson Falls, Mont., for the year ending Sept 30, 1911.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	82	800	990	497	307	120	60
2	....	81	751	980	668	292	118	55
3	....	81	702	970	840	277	116	50
4	....	80	653	960	840	262	114	51
5	....	82	604	950	820	252	112	52
6	....	84	556	940	800	242	110	53
7	....	86	508	930	780	232	108	54
8	....	88	461	920	760	223	106	55
9	....	90	414	880	680	214	105	56
10	....	92	456	840	604	205	104	58
11	....	94	497	800	642	196	102	60
12	88	102	463	760	623	196	100	62
13	88	110	430	720	604	192	98	64
14	87	118	397	680	586	188	96	66
15	87	126	406	740	568	184	95	66
16	87	222	414	800	550	180	94	65
17	86	278	518	960	532	176	93	65
18	86	334	622	910	463	172	92	64
19	86	543	726	860	430	168	91	64
20	86	752	830	810	397	164	90	63
21	85	961	935	760	401	160	89	63
22	85	1,170	1,040	826	405	157	88	64
23	85	1,250	1,080	893	409	154	87	66
24	84	1,000	1,060	960	414	151	86	63
25	84	760	1,050	810	398	148	85	60
26	83	532	1,040	660	382	137	84	58
27	83	497	1,030	510	367	126	81	58
28	82	523	1,020	365	352	126	78	58
29	....	550	1,010	398	337	126	75	58
30	....	577	1,000	431	322	124	70	58
31	....	604	....	464	....	122	65	....

NOTE.—Daily discharge determined from a rating curve fairly well defined below 600 second-feet. Discharge interpolated for days for which gage heights are missing.

Monthly discharge of Prospect Creek near Thompson Falls, Mont., for the year ending Sept. 30, 1911.

[Drainage area, 139 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
February 12-28	88	82	85.4	0.614	0.39	2,880	C.
March	1,250	80	385	2.77	3.19	23,700	C.
April	1,080	397	716	5.15	5.75	42,600	C.
May	990	365	790	5.68	6.55	48,600	C.
June	840	322	549	3.95	4.41	32,700	B.
July	307	122	189	1.36	1.57	11,600	B.
August	120	65	95.2	.685	.79	5,850	B.
September	66	50	59.6	.429	.48	3,550	B.
The period	....	....	....	....	....	171,000	

PRIEST RIVER AT FALK'S RANCH, NEAR PRIEST RIVER, IDAHO.

Location.—In sec. 20, T. 57 N., R. 4 W., at Falk's ranch, about 4 miles above lower West Fork of Priest River, 8 miles north of Priest River, and about 18 miles below Priest Lake.

Records available.—March 2 to September 30, 1911.

Drainage area.—792 square miles.

Gage.—Vertical staff fastened to tree on left bank.

Channel.—Gravel; practically permanent.

Discharge measurements.—Made from a cable about 100 feet above the gage, or by wading.

Winter flow.—Affected by ice.

Accuracy.—Good rating curves have been developed, but results are only fair because of effects of log driving and ice.

Cooperation.—Discharge measurements, except that of July 22, 1911, have been furnished by the United States Forest Service.

Discharge measurements of Priest River at Falk's ranch, near Priest River, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 2	E. W. Kramer	2.50	592	May 6	L. V. Smith	7.22	4,240
Apr. 7	L. V. Smith	3.80	1,200	June 7	E. W. Kramer	7.20	4,170
20	do	4.45	1,470	July 22	F. C. Ebert	4.00	1,360
23	do	5.00	1,750	28	F. E. Bonner	3.60	1,200
29	do	5.90	2,530	Sept. 25	G. H. Lautz	2.40	538

Daily gage height, in feet, of Priest River at Falk's ranch, near Priest River, Idaho, for the year ending Sept. 30, 1912.

[J. F. Falk, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1			6.0	7.0	5.7	3.5	2.5
2	2.5	3.9	6.0	7.1	5.7	3.4	2.5
3		3.9	6.3	7.3	5.6	3.4	2.6
4		3.9	6.6	7.3	5.5	3.5	2.7
5	2.4	3.9	6.8	7.3	5.4	3.4	2.6
6		3.9	7.1	7.2	5.3	3.4	2.6
7		3.8	7.9	7.2	5.2	3.4	2.5
8		3.8	7.5	7.2	5.1	3.4	2.5
9		3.9	7.6	7.1	5.0	3.4	2.5
10		4.0	7.6	7.1	5.0	3.3	2.5
11		4.0	7.5	7.0	4.9	3.3	2.5
12	2.5	4.0	7.5	7.1	4.8	3.2	2.4
13		4.0	7.5	7.2	4.7	3.1	2.4
14		4.0	7.4	7.3	4.6	3.1	2.4
15		4.0	7.4	7.3	4.5	3.0	2.4
16		4.0	7.5	7.3	4.5	3.0	2.5
17		4.1	7.4	7.1	4.4	3.0	2.5
18		4.2	7.8	7.0	4.3	3.0	2.5
19		4.3	7.9	6.9	4.2	2.9	2.5
20		4.5	8.0	6.8	4.1	2.9	2.5
21	2.8	4.5	7.9	6.6	4.0	2.9	2.5
22	2.9	4.7	7.9	6.4	4.0	2.8	2.4
23		5.0	7.8	6.4	4.0	2.8	2.4
24		5.1	7.7	6.3	3.9	2.8	2.4
25	3.3	5.4	7.6	6.1	3.8	2.7	2.4
26		5.6	7.5	6.0	3.7	2.7	2.4
27		5.7	7.4	6.0	3.7	2.6	2.4
28		5.9	7.3	5.9	3.6	2.6	2.4
29		5.9	7.1	5.8	3.6	2.5	2.4
30		6.0	7.0	5.8	3.5	2.5	2.4
31			6.9		3.5	2.5	

Daily discharge, in second-feet, of Priest River at Falk's ranch, near Priest River, Idaho, for the year ending Sept. 30, 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	1,210	2,640	3,880	2,360	1,050	588
2	588	1,250	2,640	4,040	2,360	1,000	588
3	573	1,250	2,960	4,360	2,270	1,000	633
4	558	1,250	3,310	4,360	2,190	1,050	678
5	544	1,250	3,580	4,360	2,110	1,000	633
6	550	1,250	4,040	4,200	2,040	1,000	633
7	556	1,200	5,450	4,200	1,970	1,000	588
8	562	1,200	4,700	4,200	1,900	1,000	588
9	568	1,250	4,880	4,040	1,840	1,000	588
10	574	1,300	4,880	4,040	1,840	957	588
11	581	1,300	4,700	3,880	1,780	957	588
12	588	1,300	4,700	4,040	1,720	909	544
13	603	1,300	4,700	4,200	1,660	862	544
14	618	1,300	4,530	4,360	1,610	862	544
15	633	1,300	4,530	4,360	1,560	815	544
16	648	1,300	4,700	4,360	1,560	815	588
17	663	1,350	4,530	4,040	1,500	815	588
18	678	1,400	5,250	3,880	1,450	815	588
19	693	1,450	5,450	3,730	1,400	769	588
20	708	1,560	5,650	3,580	1,350	769	588
21	723	1,560	5,450	3,310	1,300	769	588
22	769	1,660	5,450	3,070	1,300	723	544
23	831	1,840	5,250	3,070	1,300	723	544
24	894	1,900	5,060	2,960	1,250	723	544
25	957	2,110	4,880	2,740	1,200	678	539
26	993	2,270	4,700	2,640	1,150	678	533
27	1,030	2,360	4,530	2,640	1,150	633	527
28	1,060	2,540	4,360	2,540	1,100	633	521
29	1,100	2,540	4,040	2,450	1,100	588	515
30	1,140	2,640	3,880	2,450	1,050	588	509
31	1,180	....	3,730	....	1,050	588	....

NOTE.—Discharge determined from a fairly well-defined curve Mar. 2 to Sept. 24. Shifting channel methods used Sept. 25 to 30. Discharge interpolated for days for which gage heights are missing between Mar. 2 to Apr. 1.

Monthly discharge of Priest River at Falk's ranch, near Priest River, Idaho, for the year ending Sept. 30, 1911.

[Drainage area, 792 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
March 2-31	1,180	544	739	0.933	1.04	44,000	C.
April	2,640	1,200	1,580	1.99	2.22	94,000	A.
May	5,650	2,640	4,490	5.67	6.54	276,000	A.
June	4,360	2,450	3,670	4.63	5.17	218,000	A.
July	2,360	1,050	1,590	2.01	2.32	97,800	A.
August	1,050	588	831	1.05	1.21	51,100	B.
September	678	509	572	.722	.81	34,000	B.
The period	....	....	....	....	....	815,000	

PRIEST RIVER AT PRIEST RIVER, IDAHO.

Location.—At the highway bridge on the road from Priest River to Priest Lake, about 1 mile from Priest River and near the mouth of the stream.

Records available.—June 28, 1903, to April 30, 1905; November 17, 1910, to April 29, 1911.

Drainage area.—904 square miles.

Gage.—Vertical staff on bridge pier; datum unchanged.

Channel.—Gravel and small bowlders.

Discharge measurements.—Made from bridge.

Winter flow.—Apparently not seriously affected by ice.

Accuracy.—Conditions for accurate determination of discharge poor. The current at the measuring section is uneven; the gage heights are affected by log jams and possibly also by backwater from Clark Fork.

Discharge measurements of Priest River at Priest River, Idaho, in the period Nov. 17, 1910, to Apr. 29, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
1910. Nov. 17	F. C. Ebert	3.70	918
1911. Apr. 9	F. C. Ebert	[a]4.65	1,610

[a] Gage height affected by backwater from log jam.

Daily gage height, in feet, of Priest River at Priest River, Idaho, for Nov. 17, 1910, to Apr. 29, 1911.

[P. A. Finstad, observer.]

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
1		4.6	3.8	4.3	3.8	5.0	16		3.8	4.9	4.2	4.8	4.8
2		4.9	3.8	4.4	3.8	4.9	17	3.7	4.0	4.7	4.3	4.8	4.8
3		4.5	3.7	4.5	3.8	4.8	18	3.6	4.1	4.7	4.3	4.9	4.8
4		3.9	3.7	4.5	3.6	4.9	19	4.7	4.0	4.7	3.9	4.9	4.9
5		4.0	3.6	4.5	3.6	4.9	20	3.9	3.9	4.7	3.9	4.9	5.0
6		3.8	3.6	4.5	3.7	4.9	21	4.9	4.0	4.7	3.9	5.0	5.0
7		4.1	3.6	4.5	3.8	5.0	22	5.0	4.0	4.7	3.9	5.0	5.2
8		4.0	3.9	4.4	3.8	4.8	23	4.5	4.0	4.7	3.8	5.2	5.2
9		4.2	3.8	4.4	3.8	4.8	24	4.8	3.8	4.6	3.8	5.3	5.3
10		4.0	3.7	4.4	3.9	4.6	25	5.9	3.9	4.6	3.8	5.2	5.3
11		4.2	3.8	4.3	3.9	4.6	26	5.0	3.9	4.7	3.8	5.2	5.3
12		4.0	3.6	4.4	4.0	4.6	27	4.0	3.6	4.6	3.8	5.2	5.3
13		4.0	3.7	4.3	4.0	4.7	28	3.5	3.7	4.7	3.8	5.3	5.4
14		3.9	3.8	4.2	4.5	4.7	29	4.0	3.7	4.7		5.3	5.4
15		3.7	4.9	4.2	4.4	4.7	30	3.7	3.6	4.5		5.6	
							31		3.6	4.6		5.5	

NOTE.—No ice reported. The gage heights for periods Jan. 15 to Feb. 18 and Mar. 14 to Apr. 9 are believed to have been affected by backwater.

Daily discharge, in second-feet, of Priest River at Priest River, Idaho, for Nov. 17, 1910, to Apr. 29, 1911.

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
1		1,650	980		980		16		980				1,860
2		1,980	980		980		17	920	1,120				1,860
3		1,550	920		980		18	860	1,200				1,860
4		1,050	920		860		19	1,750	1,120		1,050		1,980
5		1,120	860		860		20	1,050	1,050		1,050		2,100
6		980	860		920		21	1,980	1,120		1,050		2,100
7		1,200	860		980		22	2,100	1,120		1,050		2,340
8		1,120	1,050		980		23	1,550	1,120		980		2,340
9		1,280	980		980		24	1,860	980		980		2,460
10		1,120	920		1,050	1,650	25	3,250	1,050		980		2,460
11		1,280			1,050	1,650	26	2,100	1,050		980		2,460
12		1,120			1,120	1,650	27	1,120	860		980		2,460
13		1,120			1,120	1,750	28	810	920		980		2,580
14		1,050				1,750	29	1,120	920				2,580
15		920				1,750	30	920	860				
							31		860				

NOTE.—Discharge determined from a well-defined curve. No discharges attempted for periods believed to be affected by backwater.

KETTLE RIVER AT CURLEW, WASH.

Location.—In the SE. ¼ sec. 11, T. 39 N., R. 33 E., at a highway bridge at Curlew, just below Curlew Creek.

Records available.—May 15 to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on right abutment of bridge.

Channel.—Gravel; practically permanent.

Discharge measurements.—Made from highway bridge or by wading near gage.

Diversions.—Above all important diversions.

Estimates withheld for additional data.

No discharge measurements made during the year.

Daily gage height, in feet, of Kettle River at Curlew, Wash., for the year ending Sept. 30, 1911.

Day.	May.	June.	July.	Aug.	Sept.	Day.	May.	June.	July.	Aug.	Sept.
1	......	6.8	4.9	1.3	0.7	16	5.6	5.5	2.7	1.0	1.0
2	......	7.8	5.1	1.2	.7	17	6.7	5.3	2.6	1.0	1.0
3	......	7.6	5.2	1.2	.7	18	7.0	5.1	2.4	1.0	1.1
4	......	6.7	4.6	1.3	.8	19	6.9	5.0	2.2	.9	1.0
5	......	6.0	4.2	1.2	.8	20	6.6	4.8	2.1	.9	1.0
6	......	5.9	3.9	1.2	.9	21	7.1	4.5	2.1	.9	1.0
7	......	5.7	3.7	1.2	1.0	22	6.7	4.3	2.0	.9	1.0
8	......	5.5	3.6	1.3	1.0	23	6.2	4.3	1.9	1.0	1.0
9	......	5.2	3.7	1.2	.9	24	5.7	4.5	1.8	1.0	1.0
10	......	5.4	3.8	1.3	.9	25	5.4	4.4	1.8	.9	1.0
11	......	6.2	3.6	1.3	.8	26	5.2	4.6	1.7	.9	.9
12	......	6.6	3.4	1.3	.8	27	5.0	4.6	1.7	.9	.9
13	......	7.0	3.2	1.2	.8	28	4.9	4.7	1.6	.8	.9
14	......	6.6	3.0	1.1	.8	29	4.7	4.7	1.5	.8	.9
15	5.2	6.0	2.9	1.0	.7	30	5.0	4.8	1.4	.8	.9
						31	6.4	......	1.3	......	......

ST. JOE RIVER AT AVERY, IDAHO.

Location.—In sec. 15, T. 45 N., R. 5 E., at Avery, one-half mile below the junction of North and South forks.

Records available.—January 1 to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on left bank near post office, installed July 11, 1911. Previous gage was about 500 feet downstream.

Channel.—Rocky; practically permanent.

Discharge measurements.—Made from a private suspension bridge or by wading.

Winter flow.—Seriously affected by ice.

Diversions.—Above all important diversions.

Cooperation.—Gage heights furnished by United States Forest Service.

Estimates withheld for additional data.

Discharge measurements of St. Joe River at Avery, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.		Discharge.
		Old gage.	New gage.	
		Feet.	*Feet.*	*Sec.-ft.*
1910. Nov. 20	F. C. Ebert	3.08	....	744
1911. Apr. 5	F. E. Bonner	4.49	....	2,180
June 9	E. W. Kramer	5.60	....	4,030
July 11	Ebert and Leidl	3.65	1.69	1,120

Daily gage height, in feet, of St. Joe River at Avery, Idaho, for the year ending Sept. 30, 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.8	2.8		5.5		6.5	4.2		
2	2.8	2.8		5.4					
3	2.8	2.8		5.2					
4	2.9	2.7		5.3					
5	2.9	2.7				5.7			
6	2.8	2.7			6.3	5.8			
7	2.8	2.7		4.2	6.0	5.8			
8	2.8	2.8		4.1					
9	2.8	2.8		4.4	5.6	5.5			
10	2.8	2.8		4.2	5.7	5.4			1.0
11				4.4					1.0
12				4.4			1.6		1.0
13				4.2					1.0
14				4.2	5.5				1.0
15				4.3	5.6		1.45		1.0
16	2.7								1.0
17	2.7				6.4	4.9			1.0
18	2.8								1.0
19	2.8			4.7					1.0
20	2.7			5.0	5.9				1.0
21	2.7			5.2	5.8			1.1	1.0
22	2.7			5.8	5.7			1.1	1.0
23	2.7			6.2	5.7			1.1	1.0
24	2.7			6.8				1.0	1.0
25	2.7			7.0				1.0	1.0
26	2.7			6.8				1.0	1.0
27	2.7			6.5	5.4	4.3			1.0
28	2.7			6.2		4.3			1.0
29	2.7			6.1	5.2	4.2			1.0
30	2.7		4.3			4.0			1.0
31	2.7		4.8						

ST. JOE RIVER NEAR CALDER, IDAHO.

Location.—At a logging camp 2½ miles below Calder.

Records available.—April 14 to September 27, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on right bank.

Channel.—Rocky; practically permanent.

Discharge measurements.—Made from cable 600 feet above gage.

Winter flow.—Seriously affected by ice.

Estimates withheld for additional data.

Discharge measurements of St. Joe River near Calder, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*
Aug. 12	L. R. Allen	2.23	406
1911.			
Apr. 14	F. C. Ebert	4.20	2,760

Daily gage height, in feet, of St. Joe River near Calder, Idaho, for the year ending Sept. 30, 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Day.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	6.6	6.3	3.8	2.4	1.9	16	4.3	6.3	4.9	2.8	2.1	2.2
2	......	6.8	6.8	3.8	2.5	1.9	17	4.7	6.8	4.7	2.8	2.1	2.2
3	......	......	6.6	3.7	2.4	1.9	18	4.3	6.8	4.6	2.8	2.1	2.0
4	......	7.5	6.2	3.6	2.4	2.1	19	4.2	6.8	4.4	2.8	2.1	1.9
5	......	8.2	5.6	3.5	2.5	2.2	20	5.1	6.4	4.3	2.7	2.1	1.9
6	......	8.6	5.5	3.4	2.4	2.4	21	6.3	......	4.2	2.7	2.2	1.9
7	......	7.6	5.5	3.4	2.4	2.1	22	6.6	......	4.2	2.6	2.1	1.9
8	......	6.8	5.5	3.3	2.4	2.0	23	6.9	......	4.0	2.6	2.0	2.0
9	......	6.5	5.3	3.3	2.3	2.0	24	7.6	......	4.2	2.6	2.0	1.9
10	......	6.0	5.2	3.2	2.3	1.9	25	8.1	......	4.0	2.5	2.0	1.8
11	......	5.5	5.4	3.2	2.3	1.9	26	7.9	5.6	3.8	2.5	2.0	1.8
12	......	5.6	5.7	3.1	2.2	1.9	27	7.4	5.2	3.7	2.5	1.9	1.9
13	......	5.7	5.6	3.0	2.2	1.9	28	6.8	5.1	4.0	2.4	1.9	......
14	4.2	5.6	5.4	2.9	2.2	1.9	29	6.4	5.0	3.8	2.4	1.9	......
15	4.1	5.7	5.1	2.9	2.1	1.9	30	6.5	5.1	3.7	2.4	1.9	......
							31	......	5.6	......	2.4	1.9	......

ST. MARIES RIVER AT LOTUS, IDAHO.

Location.—About three-fourths of a mile below Lotus and 9 miles above St. Maries and the mouth of the river.

Records available.—July 10 to August 12, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on right bank.

Channel.—Gravel; shifting in floods.

Discharge measurements.—Made from a footbridge three-fourths of a mile above the gage or by wading near the gage.

Estimates withheld for further data.

The following discharge measurement was made by Ebert and Leidl:

July 10, 1911: Gage height, 1.63 feet; discharge, 166 second-feet.

Daily gage height, in feet, of St. Maries River at Lotus, Idaho, for the year ending Sept. 30, 1911.

Day.	July.	Aug.	Day.	July.	Aug.	Day.	July.	Aug.
1	....	1.1	11	1.6	1.2	21	1.3	....
2	....	1.1	12	1.5	1.2	22	1.3	....
3	....	1.3	13	1.5	....	23	1.3	....
4	....	1.2	14	1.5	....	24	1.3	....
5	....	1.2	15	1.4	....	25	1.2	....
6	....	1.2	16	1.4	....	26	1.2	....
7	....	1.3	17	1.4	....	27	1.2	....
8	....	1.3	18	1.4	....	28	1.2	....
9	....	1.3	19	1.4	....	29	1.2	....
10	1.6	1.3	20	1.3	....	30	1.1	....
						31	1.1	....

NORTH FORK OF CŒUR D'ALENE RIVER AT ENAVILLE, IDAHO.

Location.—In sec. 30, T. 49 N., R. 2 E., at Enaville, about half a mile above the junction of the North and South Forks.

Records available.—March 3 to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Gravel; practically permanent.

Discharge measurements.—Made from railroad bridge half a mile below gage or by wading near the gage.

Diversions.—Above all diversions.

Accuracy.—Results fair.

Cooperation.—Gage heights furnished by United States Forest Service.

Discharge measurements of North Fork of Cœur d'Alene River at Enaville, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 3	J. P. Martin	2.80	500	July 8	Ebert and Leidl	3.53	833
May 21	F. C. Ebert	8.20	6,230	Sept. 30	Chas. Leidl	2.40	274

Daily gage height, in feet, of North Fork of Cœur d'Alene River at Enaville, Idaho, for the year ending Sept. 30, 1911.

[G. W. Burke, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	....	7.2	6.1	....	2.9	2.30
2	....	8.3	7.2	6.4	....	2.9	2.30
3	2.8	8.1	7.6	6.3	....	2.9	3.0
4	3.1	....	8.0	6.0	....	2.9	2.9
5	3.3	....	8.6	....	....	2.8	2.85
6	3.7	....	9.0	6.8	3.9	3.0	2.8
7	3.4	....	8.6	6.4	....	3.0	2.8
8	3.4	5.8	8.2	6.1	....	3.3	2.75
9	3.8	....	7.3	5.1	3.5	3.4	2.7
10	3.7	....	6.7	5.0	3.4	3.3	2.75
11	3.8	....	6.5	6.0	3.4	2.95	2.75
12	3.8	....	6.4	5.8	3.3	2.8	2.8
13	3.7	....	....	5.8	3.3	2.85	2.8
14	4.5	5.7	6.5	5.6	3.3	2.8	2.8
15	....	....	6.6	5.4	....	2.7	2.8
16	....	5.9	7.2	4.9	....	2.7	2.85
17	5.7	6.2	7.6	4.5	3.0	2.65	2.85
18	6.1	6.2	8.0	4.4	3.0	2.6	2.8
19	....	6.4	9.2	4.2	3.0	2.6	2.8
20	....	6.4	9.2	4.2	3.0	2.6	2.8
21	7.1	7.4	8.2	4.1	3.0	2.6	2.8
22	....	....	7.6	4.0	3.0	2.6	2.8
23	....	8.9	7.2	4.0	....	2.6	2.75
24	....	9.3	6.8	....	2.9	2.6	2.6
25	7.9	9.7	6.6	....	2.9	2.65	2.5
26	....	9.6	6.2	....	2.9	2.65	2.42
27	....	8.0	6.0	....	2.9	2.6	2.30
28	5.9	8.1	6.4	....	2.9	2.6	2.25
29	....	....	6.0	3.9	2.9	2.5	2.20
30	....	....	5.9	....	2.9	2.45	2.20
31	....	....	5.8	....	2.85	2.45	....

Daily discharge, in second-feet, of North Fork of Cœur d'Alene River at Enaville, Idaho, for the year ending Sept. 30, 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	5,720	4,830	3,340	1,100	490	243
2	....	6,380	4,830	3,730	1,100	490	243
3	440	6,090	5,390	3,600	1,100	490	540
4	590	6,100	5,950	3,210	1,100	490	490
5	700	6,500	6,830	3,740	1,100	440	465
6	960	5,000	7,430	4,270	1,100	540	440
7	760	4,000	6,830	3,730	1,010	540	440
8	760	2,970	6,230	3,340	910	700	418
9	1,030	3,200	4,970	2,180	820	760	395
10	960	3,200	4,130	2,070	760	700	418
11	1,030	3,400	3,860	3,210	760	515	418
12	1,030	3,200	3,730	2,970	700	440	440
13	960	3,000	3,500	2,970	700	465	440
14	1,580	2,850	3,860	2,730	700	440	440
15	2,000	2,970	3,990	2,510	650	395	440
16	2,430	3,090	4,830	1,970	600	395	465
17	2,850	3,470	5,390	1,580	540	375	465
18	3,340	3,470	5,950	1,490	540	355	440
19	3,790	3,730	7,730	1,330	540	355	440
20	4,240	3,730	7,730	1,330	540	355	440
21	4,690	5,110	6,230	1,250	540	355	440
22	4,970	6,190	5,390	1,170	540	355	440
23	5,250	7,280	4,830	1,170	515	355	418
24	5,530	7,880	4,270	1,170	490	355	355
25	5,810	8,480	3,990	1,170	490	375	315
26	4,900	8,330	3,470	1,100	490	375	285
27	4,000	5,950	3,210	1,100	490	355	243
28	3,090	6,090	3,730	1,100	490	355	226
29	3,750	5,670	3,210	1,100	490	315	210
30	4,410	5,250	3,090	1,100	490	296	210
31	5,060	....	2,970	....	465	296	....

NOTE.—Discharge determined from a fairly well defined rating curve. Discharge interpolated for days, for which no gage height was reported.

Monthly discharge of North Fork of Cœur d'Alene River at Enaville, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
March 3-31	5,810	440	2,790	160,000	B.
April	8,480	2,850	4,940	294,000	B.
May	7,730	2,970	4,920	303,000	B.
June	4,270	1,100	2,220	132,000	B.
July	1,100	465	705	43,300	A.
August	760	296	436	26,800	A.
September	540	210	389	23,100	A.
The period	....	....	....	982,000	

CŒUR D'ALENE RIVER NEAR CATALDO, IDAHO.

Location.—In sec. 26, T. 49 N., R. 1 E., 1½ miles above Cataldo and about 3 miles below the junction of the North and South forks.

Records available.—April 25 to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff in two sections on the right bank.

Channel.—Clay and rocks; practically permanent.

Discharge measurements.—Made from a cable 300 feet above the gage, or by wading.

Accuracy.—Results good.

Cooperation.—Maintained in cooperation with the Washington Water Power Co.

Discharge measurements of Cœur d'Alene River near Cataldo, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
July 9	Ebert and Leidl	3.48	1,280
Sept. 30[a]	Chas. Leidl	2.25	557

[a] Accuracy of measurement affected by upstream wind.

Daily gage height, in feet, of Cœur d'Alene River near Cataldo, Idaho, for the year ending Sept. 30, 1911.

[Martin Petsnik, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Day.	Apr.	May.	June.	July.	Aug.	Sept.
1			6.9	3.8	2.7	2.3	16		7.1	4.7	3.1	2.5	2.4
2			7.2	3.8	2.7	2.3	17		8.2	4.4	3.1	2.5	2.5
3			7.2	3.7	2.7	2.3	18		8.3	4.3	3.0	2.5	2.5
4		8.7	6.7	3.7	2.8	2.4	19		9.7	4.2	3.0	2.5	2.5
5		9.2	6.2	3.6	2.8	2.4	20		9.8	4.2	2.9	2.5	2.4
6		8.9	5.9	3.6	2.9	2.4	21		8.6	4.1	2.9	2.4	2.4
7		9.0	5.8	3.5	3.0	2.5	22		8.0	4.2	2.9	2.4	2.4
8		8.2	5.8	3.5	3.0	2.4	23		7.7	3.9	2.9	2.4	2.3
9		7.4	5.4	3.4	3.0	2.4	24		7.5	4.0	2.8	2.4	2.3
10		7.4	5.5	3.4	2.9	2.3	25	10.2	7.0	4.1	2.8	2.4	2.2
11		7.3	5.4	3.3	2.8	2.3	26	10.3	6.7	3.9	2.7	2.4	2.3
12		6.9	5.4	3.2	2.7	2.3	27	9.6	6.4	3.9	2.7	2.4	2.3
13		6.5	5.3	3.2	2.6	2.3	28	8.6	6.1	3.8	2.7	2.4	2.3
14		6.8	5.0	3.2	2.6	2.3	29	7.9	6.1	3.8	2.7	2.3	2.3
15		6.5	4.9	3.1	2.6	2.3	30	7.6	6.0	3.8	2.7	2.3	2.3
							31		6.1		2.7	2.3	

Daily discharge, in second-feet, of Cœur d'Alene River near Cataldo, Idaho, for the year ending Sept. 30, 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Day.	Apr.	May.	June.	July.	Aug.	Sept.
1		7,600	5,540	1,400	610	405	16		5,940	2,330	840	500	450
2		8,220	6,140	1,400	610	405	17		8,290	2,000	840	500	500
3		8,840	6,140	1,310	610	405	18		8,520	1,890	780	500	500
4		9,460	5,150	1,310	665	450	19		11,900	1,780	780	500	500
5		10,700	4,290	1,220	665	450	20		12,220	1,780	720	500	450
6		9,940	3,840	1,220	720	450	21		9,220	1,680	720	450	450
7		10,200	3,700	1,140	780	500	22		7,850	1,780	720	450	450
8		8,290	3,700	1,140	780	450	23		7,190	1,490	720	450	405
9		6,560	3,170	1,060	780	450	24		6,770	1,580	665	450	405
10		6,560	3,300	1,060	720	405	25	13,200	5,740	1,680	665	450	365
11		6,350	3,170	980	665	405	26	13,500	5,150	1,490	610	450	405
12		5,540	3,170	910	610	405	27	11,700	4,620	1,490	610	450	405
13		4,790	3,040	910	555	405	28	9,220	4,130	1,400	610	450	405
14		5,340	2,670	910	555	405	29	7,630	4,130	1,400	610	405	405
15		4,790	2,550	840	555	405	30	6,980	3,980	1,400	610	405	405
							31		4,130		610	405	

NOTE.—Discharge determined from a rating curve well defined between 300 and 7,000 second-feet. Discharge May 1 to 3, interpolated.

Monthly discharge of Cœur d'Alene River near Cataldo, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April 25-30	13,500	6,980	10,400	124,000	B.
May	12,200	3,980	7,190	442,000	B.
June	6,140	1,400	2,820	168,000	A.
July	1,400	610	901	55,400	A.
August	780	405	555	34,100	A.
September	500	365	430	25,600	A.
The period				849,000	

CŒUR D'ALENE LAKE AT CŒUR D'ALENE, IDAHO.

Location.—About 800 feet southeast of the railroad station at Cœur d'Alene.

Records available.—February 11, 1905, to September 30, 1911; April 26, 1903, to February 10, 1905, at gage of the St. Joe Boom Co., at the mouth of the St. Joe River.

Drainage area.—Not measured.

Gage.—Vertical staff.

Cooperation.—Gage-height record furnished by the Washington Water Power Co.

Daily gage height, in feet, of Cœur d'Alene Lake at Cœur d'Alene, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	21.3	21.45	25.25	22.8	21.95	21.2	26.4	28.3	27.7	26.5	25.0	24.0
2	21.3	21.4	25.1	22.75	22.0	21.15	26.7	28.3	27.65	26.45	25.0	23.95
3	21.3	21.4	25.0	22.65	22.0	21.1	27.0	28.3	27.65	26.45	25.0	23.95
4	21.5	21.35	24.9	22.6	22.0	21.1	27.2	28.4	27.7	26.5	25.05	23.9
5	21.65	21.3	24.9	22.6	22.0	21.15	27.25	28.5	27.65	26.5	25.05	23.8
6	21.75	21.3	24.9	22.55	22.0	21.2	27.2	28.8	27.55	26.5	25.05	23.8
7	21.8	21.3	24.9	22.55	22.0	21.2	27.1	29.0	27.4	26.5	25.1	23.8
8	21.85	21.3	24.8	22.55	21.9	21.35	26.9	29.15	27.25	26.5	25.0	23.75
9	21.9	21.55	24.75	22.6	21.9	21.5	26.75	29.15	27.15	26.45	25.0	23.6
10	21.9	21.8	24.65	22.6	21.9	21.6	26.65	29.1	27.0	26.45	24.9	23.55
11	21.9	22.2	24.6	22.55	21.85	21.75	26.55	28.9	26.8	26.5	25.0	23.5
12	21.9	22.7	24.5	22.5	21.8	21.85	26.5	28.75	26.75	26.5	25.0	23.4
13	21.9	23.3	24.35	22.45	21.8	21.95	26.4	28.6	26.6	26.5	25.0	23.4
14	21.9	23.6	24.25	22.4	21.8	22.1	26.25	28.4	26.7	26.5	25.0	23.3
15	21.85	23.8	24.1	22.35	21.75	22.25	26.1	28.25	26.6	26.5	25.0	23.3
16	21.9	23.95	23.95	22.3	21.7	22.5	26.0	28.2	26.6	26.4	25.0	23.25
17	21.9	24.0	23.85	22.25	21.6	22.8	25.8	28.2	26.5	26.3	25.0	23.2
18	21.85	24.1	23.7	22.2	21.6	23.15	25.7	28.4	26.5	26.2	24.9	23.15
19	21.8	24.1	23.6	22.2	21.55	23.5	25.75	28.55	26.45	26.1	24.85	23.12
20	21.8	24.1	23.45	22.2	21.5	23.85	25.75	28.75	26.5	26.05	24.8	23.1
21	21.8	24.2	23.3	22.2	21.45	24.3	25.8	28.9	26.5	25.95	24.7	23.1
22	21.8	24.6	23.2	22.15	21.4	24.7	25.95	29.0	26.5	25.85	24.6	23.0
23	21.7	25.3	23.2	22.1	21.4	25.25	26.2	29.0	26.45	25.7	24.5	22.95
24	21.7	25.6	23.1	22.1	21.35	25.75	26.6	28.9	26.45	25.55	24.5	22.85
25	21.7	25.8	23.1	22.05	21.35	26.2	27.0	28.8	26.45	25.55	24.45	22.8
26	21.6	25.8	23.1	22.0	21.3	26.3	27.45	28.7	26.5	25.5	24.35	22.75
27	21.6	25.7	23.05	21.95	21.2	26.4	27.85	....	26.5	25.4	24.3	22.7
28	21.55	25.6	23.0	21.9	21.2	26.4	28.1	28.35	26.55	25.3	24.2	22.7
29	21.55	25.55	22.95	21.9	....	26.35	28.3	28.2	26.5	25.2	24.2	22.65
30	21.5	25.45	22.9	21.9	....	26.3	28.35	28.0	26.5	25.05	24.1	22.6
31	21.45	....	22.9	21.9	....	26.3	....	27.7	....	25.0	24.05	....

Note.—Add 2,100 feet to reduce to sea level.

SPOKANE RIVER AT SPOKANE, WASH.

Location.—In sec. 9, T. 25 N., R. 43 E., at the point where Martha Street approaches the river in Spokane, 4 miles above Latah Creek.

Records available.—October 25, 1896, to September 30, 1911.

Drainage area.—4,000 square miles.

Gage.—Inclined staff. A Bristol automatic gage and vertical staff, located about 1,000 feet downstream, are maintained by the Washington Water Power Co.

Channel.—Gravel and bowlders; shifting slightly in floods.

Discharge measurements.—Made from a cable.

Regulation.—Flow is partially regulated by storage in Cœur d'Alene Lake.

Diversions.—Water is diverted in the Spokane Valley Land & Water Co.'s canal above the station for irrigation.

Accuracy.—Results good.

Cooperation.—Gage height records from the Bristol gage furnished by the Washington Water Power Co.

Discharge measurements of Spokane River at Spokane, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.		Discharge.
		W. W. P. gage.	Martha St. gage.	
1910.		*Feet.*	*Feet.*	*Sec.-ft.*
Nov. 22	F. C. Ebert	....	20.06	5,620
Dec. 14	.....do	....	20.58	6,560
1911.				
Apr. 7	.....do	....	23.66	12,800
May 19	.....do	76.23	24.96	15,600
July 6	Ebert and Leidl	70.87	19.31	4,130
14	F. C. Ebert	69.69	18.08	2,610

Daily gage height, in feet, of Spokane River at Spokane, Wash., for the year ending Sept. 30, 1911.

[Martha Street gage. A. C. Lingle, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	17.55	17.6	20.6	18.8	18.5	17.8	22.8	24.8	24.2	19.8	17.3	17.7
2	17.5	17.6	20.55	18.7	18.5	17.8	23.0	24.8	24.2	20.0	17.2	17.5
3	17.35	17.65	20.6	18.7	18.5	17.7	23.3	24.8	24.1	19.5	17.2	17.1
4	17.7	17.65	20.55	18.7	18.5	18.0	23.5	24.8	24.2	19.3	17.4	17.5
5	17.75	17.65	20.55	18.6	18.5	17.8	23.7	24.9	24.2	19.4	18.0	17.5
6	17.7	17.75	20.75	18.6	18.4	17.8	23.7	25.1	24.1	19.3	17.8	17.7
7	17.65	17.5	20.55	18.5	18.4	17.9	23.6	25.3	24.0	19.3	18.1	17.9
8	17.55	17.65	20.55	18.5	18.5	17.7	23.5	25.4	23.8	19.2	18.5	18.1
9	17.7	17.6	20.55	18.5	18.5	18.3	23.3	25.6	23.7	19.0	18.1	18.1
10	17.35	17.65	20.5	18.6	18.4	17.8	23.2	25.6	23.6	18.5	18.1	18.0
11	17.55	17.65	20.45	18.5	18.4	18.1	23.1	25.5	23.4	18.5	17.2	18.0
12	17.5	17.65	20.4	18.6	18.5	18.4	23.1	25.3	23.3	18.4	17.0	17.9
13	17.65	17.8	20.35	18.5	18.3	18.2	23.0	25.1	23.0	18.3	17.0	17.7
14	17.55	17.55	20.25	18.5	18.4	18.6	22.9	25.0	22.6	18.0	17.1	17.7
15	17.65	17.7	20.15	18.5	18.5	18.7	22.8	24.8	22.6	18.2	17.2	17.7
16	17.6	18.25	20.1	18.5	18.6	18.8	22.5	24.7	22.2	19.4	17.3	....
17	17.25	18.25	19.95	18.5	18.5	19.1	22.4	24.7	21.9	19.4	17.3	....
18	17.7	18.3	20.0	18.5	17.9	19.4	22.3	24.8	21.2	19.0	17.5	....
19	17.7	18.3	19.95	18.5	17.9	19.7	22.3	24.9	20.7	18.7	18.0	....
20	17.7	19.0	19.8	18.5	17.8	20.1	22.3	25.1	19.8	19.2	18.1	....
21	17.7	18.85	19.6	18.4	17.8	20.6	22.2	25.3	20.2	19.4	18.2	....
22	17.65	20.2	19.35	18.5	17.6	20.9	22.4	25.4	20.2	19.2	18.3	....
23	17.8	19.85	19.3	18.4	17.4	21.4	22.6	25.4	20.2	19.2	18.1	....
24	17.45	20.55	19.25	18.5	18.2	21.9	23.0	25.3	20.8	18.8	17.8	....
25	17.55	20.6	19.1	18.5	17.7	22.4	23.5	25.3	19.8	18.4	18.1	....
26	17.6	21.1	18.85	18.5	17.8	22.6	23.8	25.2	20.1	18.7	18.0	....
27	17.55	21.05	19.0	18.5	17.8	22.8	24.2	25.0	20.0	18.8	17.9	....
28	17.6	21.0	19.05	18.2	17.8	22.8	24.6	24.9	20.1	18.9	17.8	....
29	17.6	20.85	19.1	18.2	....	22.8	24.8	24.8	20.1	19.1	17.7	....
30	17.75	20.2	18.85	18.0	....	22.7	24.8	24.6	20.0	18.8	18.0	....
31	17.5	....	18.85	18.3	....	22.7	....	24.4	....	17.7	17.7	....

Daily gage height, in feet, of Spokane River at Spokane, Wash., for the year ending Sept. 30, 1910.

[Washington Water Power Co. gage. A. C. Lingle, observer.]

Day.	Feb.	Mar.	Day.	Feb.	Mar.	Day.	Feb.	Mar.
1	......	......	11	......	75.7	21	70.1	......
2	......	......	12	......	75.7	22	70.2	......
3	......	......	13	......	75.7	23	70.2	......
4	......	72.5	14	......	......	24	70.0	......
5	......	73.4	15	......	......	25	70.0	......
6	......	74.6	16	70.4	76.0	26	69.9	......
7	......	75.2	17	70.0	76.5	27	70.4	......
8	......	75.5	18	70.0	76.7	28	70.5	......
9	......	75.8	19	70.1	77.0	29	......	......
10	......	75.8	20	70.1	......	30	......	......
						31	......	......

NOTE.—These gage heights observed simultaneously with those of the Martha Street gage for comparative purposes.

Daily gage height, in feet, of Spokane River at Spokane, Wash., for the year ending Sept. 30, 1911.

[Washington Water Power Co. gage. A. C. Lingle, observer.]

Day.	May.	June.	July.	Aug.	Sept.	Day.	May.	June.	July.	Aug.	Sept.
1	......	75.5	71.4	68.9	69.3	16	76.0	73.5	71.0	68.9	......
2	......	75.4	71.5	68.8	69.1	17	75.9	73.3	71.0	69.0	......
3	......	75.4	71.0	68.9	68.8	18	76.0	72.6	70.5	69.1	......
4	......	75.5	70.8	69.0	69.2	19	76.4	72.2	70.3	69.5	......
5	......	75.5	71.0	69.6	69.2	20	76.4	71.3	70.8	69.7	......
6	......	75.4	70.9	69.4	69.4	21	76.5	71.7	70.9	69.9	......
7	......	75.4	70.8	69.6	69.6	22	76.6	71.7	70.8	69.9	......
8	......	75.2	70.8	70.0	69.7	23	76.6	71.7	70.7	69.7	......
9	......	75.0	70.6	69.8	69.7	24	76.5	72.3	70.4	69.4	......
10	......	74.9	70.1	69.7	69.6	25	76.5	71.3	70.0	69.6	......
11	......	74.8	70.1	68.8	69.6	26	76.5	71.6	70.2	69.6	......
12	......	74.6	69.9	68.7	69.6	27	76.3	71.5	70.4	69.5	......
13	......	74.3	69.9	68.7	69.3	28	76.1	71.6	70.5	69.4	......
14	76.2	74.0	69.7	68.7	69.4	29	76.0	71.6	70.7	69.3	......
15	76.1	74.0	69.8	68.9	69.4	30	75.8	71.5	70.4	69.6	......
						31	75.7	......	69.4	69.3	......

NOTE.—These gage heights observed simultaneously with those of the Martha Street gage for comparative purposes.

Daily gage height, in feet, of Spokane River at Spokane, Wash., for the year ending Sept. 30, 1911.

[Washington Power Co. gage. (Mean from Bristol records.)]

Day.	July.	Aug.	Sept.	Day.	July.	Aug.	Sept.	Day.	July.	Aug.	Sept.
1	......	69.0	69.3	11	......	68.8	69.6	21	......	69.8	69.3
2	......	68.9	69.4	12	......	68.8	69.5	22	......	69.9	69.4
3	......	68.8	68.9	13	......	68.8	69.3	23	......	69.7	69.4
4	......	68.9	69.2	14	......	68.8	69.4	24	70.2	69.0	69.3
5	......	69.6	69.1	15	......	68.8	69.4	25	70.0	69.7	69.4
6	......	69.3	69.3	16	......	68.9	69.4	26	70.3	69.6	69.4
7	......	69.9	69.5	17	......	68.9	69.4	27	70.4	69.4	69.3
8	......	69.9	69.7	18	......	69.4	69.4	28	70.4	69.4	69.2
9	......	69.7	69.7	19	......	69.6	69.2	29	70.6	69.3	69.3
10	......	69.4	69.5	20	......	69.7	69.2	30	70.2	69.5	69.2
								31	69.3	69.4	......

Daily discharge, in second-feet, of Spokane River at Spokane, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2,130	2,190	6,590	3,750	3,320	2,430	10,800	15,300	13,700	4,950	1,850	2,190
2	2,070	2,190	6,500	3,600	3,320	2,430	11,300	15,300	13,700	5,250	1,750	2,310
3	1,910	2,250	6,590	3,600	3,320	2,310	11,900	15,300	13,500	4,520	1,650	1,750
4	2,310	2,250	6,500	3,600	3,320	2,670	12,300	15,300	13,700	4,240	1,750	2,070
5	2,370	2,250	6,500	3,460	3,320	2,430	12,700	15,500	13,700	4,380	2,550	1,960
6	2,310	2,370	6,860	3,460	3,180	2,430	12,700	16,000	13,500	4,240	2,190	2,190
7	2,250	2,070	6,500	3,320	3,180	2,550	12,500	16,500	13,200	4,240	2,920	2,430
8	2,130	2,250	6,500	3,320	3,320	2,310	12,300	16,700	12,700	4,100	2,920	2,670
9	2,310	2,190	6,500	3,320	3,320	3,050	11,900	17,200	12,500	3,820	2,670	2,670
10	1,910	2,250	6,410	3,460	3,180	2,430	11,700	17,200	12,300	3,150	2,310	2,430
11	2,130	2,250	6,320	3,320	3,180	2,790	11,500	17,000	11,800	3,150	1,650	2,550
12	2,070	2,250	6,240	3,460	3,320	3,180	11,500	16,500	11,500	3,020	1,650	2,430
13	2,250	2,430	6,160	3,320	3,050	2,920	11,300	16,000	10,900	2,900	1,650	2,190
14	2,130	2,130	5,980	3,320	3,180	3,460	11,100	15,700	9,980	2,540	1,650	2,310
15	2,250	2,310	5,820	3,320	3,320	3,600	10,800	15,200	9,980	2,780	1,650	2,310
16	2,190	2,980	5,730	3,320	3,460	3,750	10,200	15,000	9,160	4,380	1,750	2,310
17	1,810	2,980	5,490	3,320	3,320	4,200	10,000	15,000	8,560	4,380	1,750	2,310
18	2,310	3,050	5,570	3,320	2,550	4,650	9,800	15,200	7,220	3,820	2,310	2,310
19	2,310	3,050	5,490	3,320	2,550	5,100	9,800	15,500	6,340	3,410	2,550	2,070
20	2,310	4,050	5,250	3,320	2,430	5,740	9,800	16,000	4,950	4,100	2,670	2,070
21	2,310	3,820	4,950	3,180	2,430	6,590	9,590	16,500	5,550	4,380	2,790	2,190
22	2,250	5,900	4,580	3,320	2,190	7,100	10,000	16,700	5,550	4,100	2,920	2,310
23	1,860	5,330	4,500	3,180	1,960	8,030	10,400	16,700	5,550	4,100	2,670	2,310
24	2,020	6,500	4,420	3,320	2,920	8,980	11,300	16,500	6,500	3,310	1,850	2,190
25	2,130	6,590	4,200	3,320	2,310	10,000	12,300	16,500	4,950	3,050	2,670	2,310
26	2,190	7,540	3,820	3,320	2,430	10,400	13,000	16,200	5,400	3,450	2,550	2,310
27	2,130	7,440	4,050	3,320	2,430	10,800	13,900	15,700	5,250	3,590	2,310	2,190
28	2,190	7,340	4,120	2,920	2,430	10,800	14,800	15,500	5,400	3,590	2,310	2,070
29	2,190	7,060	4,200	2,920	....	10,800	15,300	15,200	5,400	3,880	2,190	2,190
30	2,370	5,900	3,820	2,670	....	10,600	15,300	14,700	5,250	3,310	2,430	2,070
31	2,070	....	3,820	3,050	....	10,600	....	14,200	....	2,190	2,310	....

NOTE.—Discharge Oct. 1, 1910, to July 23, 1911, determined from two well-defined rating curves applicable to the Martha Street gage. Discharge July 24 to Sept. 30, 1911, determined from a well-defined rating curve applicable to the Washington Water Power Co. gage.

Monthly discharge of Spokane River at Spokane, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off.	Accuracy.
	Maximum.	Minimum.	Mean.	Total in acre-feet.	
October	2,370	1,810	2,170	133,000	B.
November	7,540	2,070	3,770	224,000	B.
December	6,860	3,820	5,480	337,000	A.
January	3,750	2,670	3,310	204,000	A.
February	3,460	1,960	2,940	163,000	A.
March	10,800	2,310	5,460	336,000	A.
April	15,300	9,590	11,700	696,000	A.
May	17,200	14,200	15,900	978,000	A.
June	13,700	4,950	9,260	551,000	A.
July	5,250	2,190	3,750	231,000	A.
August	2,920	1,650	2,220	136,000	A.
September	2,670	1,750	2,260	134,000	A.
The year	17,200	1,650	5,690	4,120,000	

SPOKANE VALLEY LAND & WATER CO.'S CANAL AT POST FALLS, IDAHO.

Location.—At the lower end of the 1,600-foot flume diverting from Spokane River at Post Falls.

Records available.—May 20 to September 30, 1911.

Gage.—Vertical staff reading depths in flume.

Channel.—Wooden flume.

Discharge measurements.—Made from footbridge at gage.

Accuracy.—Results good.

Cooperation.—Gage-height record furnished by Spokane Valley Land & Water Co.

Discharge measurements of Spokane Valley Land & Water Co.'s canal at Post Falls, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
June 8	F. C. Ebert	3.31	184	June 8	F. C. Ebert	2.80	122
8	do	3.10	157	8	do	2.00	56.8

Daily gage height in feet, and discharge in second-feet, of Spokane Valley Land & Water Co.'s canal at Post Falls, Idaho, for the year ending Sept. 30, 1911.

Day.	May.		June.		July.		August.		September.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1			3.15	164	2.30	77	3.05	151	2.50	93
2			3.15	164	2.65	107	2.95	139	2.20	70
3			3.15	164	2.70	112	2.95	139	2.20	70
4			3.15	164	2.90	133	2.95	139	2.20	70
5			3.15	164	2.95	139	2.95	139	2.20	70
6			3.15	164	2.95	139	2.95	139	2.20	0
7			3.15	164	2.95	139	2.95	139	2.20	70
8			3.15	164	2.65	107	2.95	139	2.20	70
9			3.15	164	3.00	145	2.95	139	2.20	70
10			3.15	164	3.10	157	2.95	139	2.20	70
11			3.15	164	3.10	157	2.95	139	2.20	70
12			3.15	164	3.10	157	2.95	139	2.20	70
13			3.15	164	3.10	157	2.95	139	2.20	70
14			3.15	164	3.10	157	2.95	139	2.20	70
15			3.15	164	3.10	157	2.95	139	2.15	66
16			3.15	164	3.10	157	2.95	139	2.15	66
17			3.15	164	3.05	151	2.95	139	2.15	66
18			3.20	170	3.05	151	2.95	139	2.15	66
19			3.20	170	3.05	151	2.95	139	2.15	66
20	3.10	157	3.20	170	3.05	151	2.90	133	2.10	63
21	3.10	157	3.20	170	3.05	151	2.90	133	2.10	63
22	3.10	157	3.20	170	3.05	151	2.90	133	2.10	63
23	3.10	157		0	3.05	151	2.90	133	2.05	60
24	3.10	157		0	3.05	151	2.90	133	2.05	60
25	3.10	157		0	3.05	151	2.90	133	2.05	60
26	3.10	157		0	3.05	151	2.90	133	2.05	60
27	3.10	157		0	3.05	151	2.85	128	2.00	57
25	3.10	157		0	3.05	151	2.85	128	2.00	57
29	3.10	157	2.30	77	3.05	151	2.85	128	2.00	57
30	3.10	157	2.30	77	3.05	151	2.85	128	2.00	57
31	3.10	157			3.05	151	2.85	128		

NOTE.—Discharge determined from a well-defined rating curve.

Monthly discharge of Spokane Valley Land & Water Co.'s canal at Post Falls, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
May 20-31	157	157	157	3,740	A.
June	170	0	126	7,500	A.
July	157	77	144	8,850	A.
August	151	128	136	8,360	A.
September	93	57	66.3	3,950	A.
The period				32,400	

LITTLE SPOKANE RIVER NEAR SPOKANE, WASH.

Location.—In the SE. ¼ sec. 32, T. 27 N., R. 42 E., at a county highway bridge half a mile above the mouth and about 12 miles northwest of Spokane.

Records available.—January 24 to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on right bank.

Channel.—Sand and small bowlders; shifting.

Discharge measurements.—Made by wading or from the highway bridge.

Cooperation.—Gage-height record furnished by the Washington Water Power Co.

Estimates withheld for additional data.

No discharge measurements made during the year.

Daily gage height, in feet, of Little Spokane River near Spokane, Wash., for the year ending Sept. 30, 1911.

[Washington Water Power Co., observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	1.07	0.97	1.97	1.32	1.17	0.97	0.77	0.77
2	....	1.12	.97	1.92	1.27	1.17	.97	.77	.77
3	....	1.17	.97	1.97	1.17	1.17	1.17	.87	.77
4	....	1.12	.97	2.02	1.37	1.07	1.17	.87	.77
5	....	1.07	1.02	1.92	1.47	1.02	1.07	.87	.82
6	....	1.07	1.07	1.92	1.47	1.02	1.07	.87	.87
7	....	1.07	1.27	1.92	1.52	1.02	.97	.92	.87
8	....	1.02	1.77	1.87	1.47	1.02	.97	.97	.82
9	....	1.02	1.82	1.77	1.37	1.02	.97	.92	.82
10	....	1.02	1.67	1.72	1.37	1.02	.97	.92	.82
11	....	1.02	1.57	1.67	1.37	1.02	.97	.87	.82
12	....	1.02	1.47	1.62	1.27	1.02	.97	.87	.82
13	....	1.02	1.52	1.47	1.32	1.02	.92	.87	.82
14	....	1.02	1.57	1.42	1.32	.97	.92	.87	.82
15	....	1.07	1.57	1.37	1.32	.97	.92	.87	.82
16	....	1.07	1.67	1.37	1.32	.97	.92	.87	.82
17	....	1.07	1.57	1.37	1.37	.97	.92	.87	.82
18	....	1.07	1.77	1.32	1.37	.97	.92	.87	.82
19	....	1.07	1.82	1.32	1.37	.92	.92	.87	.82
20	....	1.07	1.92	1.32	1.37	.92	.92	.82	1.27
21	....	1.07	1.97	1.32	1.37	.92	.92	.82	1.27
22	....	1.02	1.97	1.32	1.37	.92	.92	.82	1.32
23	....	1.02	2.02	1.32	1.37	.92	.87	.82	1.32
24	1.07	1.02	2.07	1.32	1.32	.92	.82	.82	.87
25	1.07	1.02	2.07	1.27	1.32	.92	.77	.82	.87
26	1.02	1.02	2.07	1.27	1.32	.92	.77	.82	.87
27	1.02	1.02	2.12	1.27	1.37	.97	.77	.82	.87
28	1.07	.97	2.17	1.27	1.37	.97	.77	.82	.87
29	1.07	....	2.12	1.27	1.32	1.02	.77	.82	.87
30	1.07	....	2.07	1.27	1.22	.97	.77	.77	.87
31	1.07	....	2.02	....	1.17	....	.77	.77	....

SANPOIL RIVER AT KELLER, WASH.

Location.—In the NW. ¼ sec. 9, T. 29 N., R. 33 E., just below a highway bridge at Keller, three-fourths of a mile below Silver Creek, and about 22 miles north of Wilbur.

Records available.—April 29 to September 30, 1911.

Drainage area.—971 square miles.

Gage.—Vertical staff on right bank.

Channel.—Rock and gravel; practically permanent.

Discharge measurements.—Made from highway bridge 100 feet above the gage or by wading.

Diversions.—About 7 acres of land irrigated above the station.

Accuracy.—Results fair.

Cooperation.—Expense of maintenance borne by Office of Indian Affairs.

Discharge measurements of Sanpoil River at Keller, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 29	F. C. Ebert	2.00	442
June 14	....do	1.76	314
29	....do	1.57	236

Daily gage height, in feet, and discharge, in second-feet, of Sanpoil River at Keller, Wash., for the year ending Sept. 30, 1911.

Day.	April.		May.		June.		July.		August.		September.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	....	....	1.9	386	2.4	715	1.8	335	0.8	58	0.6	36
2	....	....	1.9	386	2.3	640	1.8	335	.8	58	.6	36
3	....	....	1.9	386	2.2	569	1.7	289	.8	58	.6	36
4	....	....	2.0	442	2.2	569	1.6	248	.9	72	.6	36
5	....	....	2.0	442	2.1	503	1.5	212	.8	58	.6	36
6	....	....	2.1	503	2.1	503	1.5	212	.8	58	.6	36
7	....	....	2.1	503	2.0	442	1.5	212	1.1	107	.6	36
8	....	....	2.1	503	2.0	442	1.5	212	1.0	88	.6	36
9	....	....	2.1	503	2.0	442	1.5	212	.9	72	.6	36
10	....	....	2.1	503	1.9	386	1.4	180	.9	72	.6	36
11	....	....	2.0	442	1.9	386	1.4	180	.9	72	.6	36
12	....	....	2.0	442	1.8	335	1.3	152	.8	58	.6	36
13	....	....	2.0	442	1.8	335	1.3	152	.8	58	.6	36
14	....	....	2.0	442	1.8	335	1.3	152	.8	58	.6	36
15	....	....	2.1	503	1.7	289	1.2	128	.8	58	.6	36
16	....	....	2.1	503	1.7	289	1.2	128	.8	58	.6	36
17	....	....	2.3	640	1.6	248	1.0	88	.7	46	.6	36
18	....	....	2.6	880	1.6	248	1.0	88	.7	46	.6	36
19	....	....	3.0	1,240	1.5	212	1.0	88	.7	46	.6	36
20	....	....	3.4	1,600	1.5	212	1.0	88	.7	46	.6	36
21	....	....	3.3	1,510	1.5	212	1.0	88	.7	46	.6	36
22	....	....	3.1	1,330	1.5	212	1.0	88	.7	46	.6	36
23	....	....	3.0	1,240	1.5	212	1.0	88	.6	36	.6	36
24	....	....	2.9	1,150	1.5	212	1.0	88	.6	36	.6	36
25	....	....	2.8	1,060	1.5	212	1.0	88	.6	36	.6	36
26	....	....	2.7	970	1.4	180	.9	72	6	36	.6	36
27	....	....	2.7	970	1.5	212	.9	72	.6	36	.6	36
28	....	....	2.6	880	1.6	248	.9	72	.6	36	.6	26
29	2.0	442	2.6	880	1.6	248	.9	72	.6	36	.6	36
30	1.9	386	2.4	715	1.7	289	.8	58	.6	36	.6	36
31	....	....	2.4	715	....	....	.8	58	.6	36	....	....

NOTE.—Discharge determined from a rating curve well defined below 600 second-feet.

Monthly discharge of Sanpoil River at Keller, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
May	1,600	386	746	45,900	B.
June	715	180	345	20,500	A.
July	335	58	146	8,980	B.
August	107	36	53.6	3,300	B.
September	36	36	36.0	2,140	B.
The period	....	....	....	80,800	

NESPELEM RIVER NEAR NESPELEM, WASH.

Location.—In the SE. ¼ sec. 24, T. 31 N., R. 30 E., about 1¼ miles above Nespelem, about 5 miles above Little Nespelem River, and about 6 miles above the mouth.

Records available.—May 1 to September 30, 1911.

Drainage area.—122 square miles.

Gage.—Vertical staff.

Channel.—Gravel and sand; shifting.

Discharge measurements.—Made from a footbridge at Nespelem, 1¼ miles below the gage, or by wading at gage.

Diversions.—Above all diversions.

Accuracy.—Results good.

Cooperation.—Expense of maintenance borne by Office of Indian Affairs.

Discharge measurements of Nespelem River near Nespelem, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 1	F. C. Ebert	2.29	90.6	June 12	F. C. Ebert	2.04	72.4
June 4	Charles Leidl	2.50	110	29	Charles Leidl	1.81	58.6
12	F. C. Ebert	2.06	72.8				

Daily gage height, in feet, and discharge, in second-feet, of Nespelem River near Nespelem, Wash., for the year ending Sept. 30, 1911.

[Erwine Kronk, observer.]

Day.	May.		June.		July.		August.		September.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	2.30	94	2.70	126	1.95	66	1.15	12	1.05	8
2	2.30	94	2.70	126	1.90	62	1.15	12	1.05	8
3	2.30	94	2.60	118	1.80	54	1.15	12	1.05	8
4	2.35	98	2.55	114	1.70	47	1.20	15	1.05	8
5	2.40	102	2.45	106	1.60	40	1.20	15	1.08	8
6	2.70	126	2.40	102	1.60	40	1.25	18	1.08	8
7	2.65	122	2.30	94	1.55	36	1.30	21	1.08	8
8	2.60	118	2.25	90	1.50	33	1.25	18	1.08	8
9	2.60	118	2.20	86	1.50	33	1.20	15	1.10	9
10	2.70	126	2.10	78	1.50	33	1.20	15	1.10	9
11	2.60	118	2.10	78	1.45	30	1.20	15	1.10	9
12	2.55	114	2.05	74	1.45	30	1.15	12	1.10	9
13	2.60	118	2.00	70	1.40	27	1.10	9	1.10	9
14	2.70	126	2.00	70	1.35	24	1.10	9	1.10	9
15	2.65	122	1.95	66	1.35	24	1.10	9	1.10	9
16	2.75	130	1.90	62	1.35	24	1.10	9	1.10	9
17	2.95	148	1.80	54	1.30	21	1.10	9	1.10	9
18	3.1	162	1.80	54	1.30	21	1.10	9	1.10	9
19	3.7	216	1.70	47	1.30	21	1.10	9	1.10	9
20	3.8	225	1.70	47	1.25	18	1.10	9	1.10	9
21	3.6	207	1.65	44	1.25	18	1.10	9	1.10	9
22	3.4	189	1.70	47	1.20	15	1.10	9	1.10	9
23	3.4	189	1.70	47	1.20	15	1.10	9	1.10	9
24	3.3	180	1.70	47	1.20	15	1.10	9	1.10	9
25	3.3	180	1.65	44	1.20	15	1.08	8	1.10	9
26	3.2	171	1.60	40	1.20	15	1.05	8	1.10	9
27	3.2	171	1.80	54	1.20	15	1.05	8	1.10	9
28	3.0	153	1.90	62	1.20	15	1.05	8	1.10	9
29	2.95	148	1.90	62	1.20	15	1.05	8	1.10	9
30	2.90	144	1.80	54	1.20	15	1.05	8	1.10	9
31	2.80	135	....	....	1.15	12	1.05	8	....	....

NOTE.—Discharge determined from a rating curve well defined between 10 and 120 second-feet.

Monthly discharge of Nespelem River near Nespelem, Wash., for the year ending Sept. 30, 1911.

[Drainage area, 122 square miles.]

Month.	Discharge in second-feet.			Run-off.			Accuracy.
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.	Total in acre-feet.	
May	225	94	143	1.17	1.35	8,790	A.
June	126	40	72.1	.591	.66	4,290	A.
July	66	12	27.4	.225	.26	1,690	A.
August	21	8	11.1	.091	.10	682	A.
September	9	8	8.7	.071	.08	518	A.
The period	....	....	....	....	....	16,000	

OKANOGAN RIVER AT OKANOGAN, WASH.

Location.—In sec. 16, T. 33 N., R. 26 E., at steamboat dock just above Okanogan.

Records available.—May 10 to September 30, 1911.

Drainage area.—7,740 square miles.

Gage.—Vertical staff nailed to dock on left bank.

Channel.—Gravel; practically permanent.

Discharge measurements.—Made from highway bridge 2,000 feet below gage.

Cooperation.—Gage heights furnished by United States Forest Service.

Estimates withheld for additional data.

The following discharge measurement was made by F. C. Ebert:

May 10, 1911: Gage height, 5.67 feet; discharge, 5,270 second-feet.

Daily gage height, in feet, of Okanogan River at Okanogan, Wash., for the year ending Sept. 30, 1911.

[H. I. Sohner, observer.]

Day.	May.	June.	July.	Aug.	Sept.	Day.	May.	June.	July.	Aug.	Sept.
1	......	8.5	6.8	......	2.6	16	5.6	10.6	4.9	3.1	2.1
2	......	9.8	7.4	3.5	......	17	6.6	10.4	4.9	3.1	3.2
3	......	9.7	7.0	3.5	......	18	7.3	10.2	4.8	3.0	3.2
4	......	9.6	6.8	3.5	......	19	7.2	9.4	4.8	3.0	3.3
5	......	9.4	6.6	3.5	2.9	20	7.1	8.8	4.7	3.0	3.2
6	......	8.8	6.4	......	3.1	21	7.0	8.2	4.6	2.9	3.1
7	......	8.6	6.3	3.4	3.0	22	7.1	8.0	4.4	2.9	3.1
8	......	8.4	6.2	3.5	3.0	23	7.6	7.8	4.4	2.9	3.1
9	......	8.2	6.0	3.6	......	24	7.4	8.0	4.2	2.9	3.1
10	5.6	8.4	5.8	......	2.6	25	7.3	7.6	4.2	......	3.0
11	5.5	8.4	5.6	......	2.3	26	7.0	7.4	......	......	3.0
12	5.4	9.0	5.4	3.4	2.0	27	6.9	7.4	......	......	2.9
13	5.4	9.8	5.4	3.3	2.0	28	6.8	7.4	......	......	2.8
14	5.4	10.2	5.2	3.2	1.9	29	6.8	7.2	......	2.7	2.8
15	5.4	10.5	5.1	3.2	1.9	30	7.0	7.0	......	2.7	2.8
						31	7.7	......	3.6	2.6	......

SIMILKAMEEN RIVER NEAR OROVILLE, WASH.

Location.—In the N. E. ¼ sec. 13, T. 40 N., R. 26 E., at the North Washington Power Co.'s plant, 4 miles above Oroville, 5 miles above the mouth, and below all tributaries.

Records available.—May 14 to September 30, 1911.

Drainage area.—3,450 square miles.

Gage.—Vertical staff in seven sections on left side of stream.

Channel.—Rock and gravel; practically permanent.

Discharge measurements.—Made from highway bridge at Oroville, 4 miles below the gage.

Cooperation.—Gage-height record furnished by the North Washington Power Co.

Estimates withheld for additional data.

The following discharge measurement was made by F. C. Ebert:

May 14, 1911: Gage height, 6.60 feet; discharge, 4,180 second-feet.

Daily gage height, in feet, and discharge, in second-feet, of Similkameen River near Oroville, Wash., for the year ending Sept. 30, 1911.

[C. H. Koester, observer.]

Day.	May.	June.	July.	Aug.	Sept.	Day.	May.	June.	July.	Aug.	Sept.
1	......	12.8	9.2	3.3	1.88	16	7.7	15.3	5.6	2.6	2.9
2	......	14.4	9.0	3.3	1.88	17	9.6	14.0	5.5	2.6	3.2
3	......	14.6	8.6	3.3	1.95	18	9.6	12.9	5.4	2.5	3.1
4	......	13.4	8.2	3.3	2.1	19	......	11.8	5.0	2.4	3.0
5	......	12.4	7.8	3.3	2.6	20	......	11.0	4.9	2.4	2.9
6	......	11.6	7.7	3.3	2.8	21	......	10.4	4.6	2.4	2.8
7	......	11.4	7.6	3.4	2.6	22	......	10.0	4.4	2.4	2.8
8	......	11.1	7.6	3.6	2.5	23	......	10.6	4.2	2.4	2.8
9	......	11.0	7.2	3.4	2.6	24	......	10.0	4.1	2.3	2.7
10	......	11.4	6.7	3.2	2.6	25	......	9.8	4.0	2.3	2.6
11	......	12.4	6.2	3.2	2.5	26	9.0	9.6	3.8	2.2	2.6
12	......	13.9	6.0	3.0	2.4	27	8.8	9.6	3.7	2.2	2.6
13	......	15.9	5.8	2.8	2.4	28	8.7	9.4	3.6	2.1	2.4
14	......	16.0	5.8	2.8	2.4	29	9.0	9.0	3.4	2.1	2.4
15	6.9	16.0	5.6	2.8	2.9	30	9.8	8.5	3.4	2.0	2.4
						31	11.2	......	3.3	1.93	......

SALMON CREEK NEAR OKANOGAN, WASH.

Location.—In T. 35 N., R. 25 E., just below the Conconully reservoir, about 17 miles above Okanogan.

Records available.—May 27, 1903, to September 30, 1911.

Drainage area.—121 square miles.

Gage.—Vertical staff showing head on a 20-foot Cippoletti weir. Also a vertical staff in sec. 31, T. 34 N., R. 26 E., 11 miles below the present station. Readings on both gages continuous to September 30, 1911.

Channel.—Cippoletti weir at upper station. Shifting gravel at the lower station.

Discharge measurements.—Made from a footbridge at the lower station. Weir rating used for upper station.

Regulation.—Flow controlled by storage in Conconully reservoir.

Diversions.—None above gage.

Accuracy.—Results obtained from weir considered good. No estimates for lower station.

Cooperation.—Complete records from the weir furnished by the United States Reclamation Service.

Discharge measurements of Salmon Creek near Okanogan, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 8	F. C. Ebert	0.96	18.8	May 9	F. C. Ebert	1.74	64.2
8	....do	.96	18.1	Nov. 16	Chas. Leidl	.46	2.4

Daily gage height, in feet, of Salmon Creek near Okanogan, Wash., for the year ending Sept. 30, 1911.

[Forrest Jones, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.4	0.4	0.45	0.33	0.21	0.25	0.33	1.62	1.85	1.00	0.95	0.60
2	.4	.4	.45	.33	.21	.25	.33	1.75	1.95	1.00	.95	.50
3	.5	.4	.45	.35	.21	.25	.35	1.75	2.10	1.00	.95	.50
4	.35	.4	.45	.33	.21	.25	.35	1.00	2.20	1.00	1.85	.50
5	.4	.4	.45	.35	.21	.25	.35	1.58	2.20	1.95	2.00	.50
6	.35	.4	.45	.33	.21	.25	.35	1.90	2.20	1.95	1.20	.50
7	.35	.45	.45	.33	.25	.27	.35	1.83	2.15	1.95	1.10	.40
8	.35	.4	.45	.33	.25	.29	.35	1.83	2.15	1.95	1.00	.35
9	.35	.4	.45	.29	.25	.29	.35	1.70	2.15	1.95	.95	.35
10	.35	.4	.45	.25	.25	.29	.35	1.80	2.20	2.00	.95	.30
11	.35	.4	.45	.25	.25	.33	.38	1.85	2.20	2.00	.90	.30
12	.35	.45	.45	.25	.25	.33	.38	1.90	1.20	2.00	.90	.30
13	.6	.4	.45	.17	.27	.33	.38	1.90	1.00	2.00	.90	.25
14	.6	.45	.45	.06	.27	.33	.38	1.85	1.50	2.00	.75	.25
15	.6	.45	.45	.05	.27	.33	.38	1.60	1.65	2.00	.70	.25
16	.65	.45	.45	.05	.27	.33	.38	1.40	1.65	2.00	.70	.25
17	.65	.45	.45	.08	.27	.33	.38	.95	1.85	2.05	.55	.20
18	.65	.5	.45	.08	.27	.33	.79	.95	1.90	2.05	.50	.20
19	.6	.5	.4	.08	.27	.35	.81	.95	2.00	2.05	.85	.20
20	.6	.45	.4	.12	.27	.38	.83	.95	2.00	2.05	.85	.20
21	.6	.4	.4	.12	.26	.38	.92	.95	2.10	2.15	1.00	.20
22	.6	.4	.4	.12	.25	.35	.96	1.30	2.05	2.15	.95	.20
23	.6	.4	.4	.17	.25	.33	1.00	1.35	2.05	2.15	1.00	.20
24	.6	.4	.4	.17	.25	.33	1.00	1.35	1.75	2.10	1.00	.20
25	.6	.4	.4	.17	.25	.33	1.00	1.60	1.30	2.10	1.45	.20
26	.6	.4	.4	.19	.25	.33	1.42	1.70	1.30	2.10	1.55	.20
27	.6	.4	.4	.19	.25	.33	1.42	1.75	1.15	2.10	1.50	.20
28	.5	.4	.4	.21	.25	.33	1.42	1.75	1.00	2.05	1.45	.20
29	.4	.4	.4	.21	......	.33	1.42	1.80	1.00	2.00	1.45	.20
30	.4	.4	.4	.21	......	.33	1.42	1.80	1.00	2.00	1.25	.20
31	.4	......	.4	.21	......	.33	......	1.85	......	1.00	1.25	......

Daily gage height, in feet, and discharge, in second-feet, of 20-foot Cippoletti weir at Conconully dam, near Okanogan, Wash., for the year ending Sept. 30, 1911.

Mean gage heights.	Day.		Length of run.	Discharge.		
	From—	To—		Second-feet.	Total acre-feet.	Acre-feet for month.
			Hrs. m.			
0.82	Aug. 19, 7.30 p. m.	Aug. 23, 8 p. m.	96 30	50.0	402.1	
.87	23, 8 p. m.	26, 7 p. m.	71 00	54.6	323.1	
.97	26, 7 p. m.	30, 3.30 p. m.	92 30	64.3	533.1	
.77	30, 3.30 p. m.	31, 12 p. m.	32 30	45.5	122.14	
						3,734.79
.87	Sept. 1, 12 a. m.	Sept. 1, 8 a. m.	8 00	54.6	36.4	
.77	1, 8 a. m.	2, 8 a. m.	24 00	45.5	91.0	
.67	2, 8 a. m.	3, 8 a. m.	24 00	36.9	73.8	
.67	3, 8 a. m.	4, 8 a. m.	24 00	36.9	73.8	
.65	4, 8 a. m.	5, 8 a. m.	24 00	35.3	70.6	
.66	5, 8 a. m.	6, 8 a. m.	24 00	36.1	72.2	
.40	6, 8 a. m.	7, 8 a. m.	24 00	17.0	34.0	
.34	7, 8 a. m.	8, 8 a. m.	24 00	7.9	15.8	
.23	8, 8 a. m.	9, 8 a. m.	24 00	7.4	14.8	
.22	9, 8 a. m.	12, 8 a. m.	72 00	6.9	41.4	
.21	12, 8 a. m.	30, 12 p. m.	448 00	6.5	242.6	
						766.40
.11	Oct. 1, 12 a. m.	Oct. 3, 4 p. m.	64 00	2.5	13.4	
.00	3, 4 p. m.	11, 6 p. m.	194 00	....	....	
.20	11, 6 p. m.	21, 4.30 p. m.	238 30	6.0	119.3	
.08	21, 4.30 p. m.	31, 12. p. m.	247 30	1.5	30.9	
						163.60

Daily gage height, in feet, and discharge, in second-feet, of 20-foot Cippoletti weir at Conconully dam, near Okanogan, Wash., for the year ending Sept. 30, 1911—Continued.

Mean gage heights.	Date.		Length of run.	Discharge.		
	From—	To—		Second-feet.	Total acre-feet.	Acre-feet for month.
			Hrs. m.			
0.08	Nov. 1, 12 a. m.	Nov. 30, 12 p. m.	30 days	1.5	90.0	
						90.00
.08	Dec. 1, 12 a. m.	Dec. 31, 12 p. m.	31 days	1.5	93.0	
						93.00
.10	Jan. 1, 12 a. m.	Jan. 4, 4 p. m.	88 00	2.1	15.3	
.06	4, 4 a. m.	14, 2 p. m.	238 00	1.0	19.7	
.14	14, 2 a. m.	31, 12 p. m.	418 00	3.5	120.9	
			744 00			
						155.9
.14	Feb. 1, 12 a. m.	Feb. 4, 4 p. m.	88 00	3.5	25.5	
.09	4, 4 p. m.	28, 12 p. m.	584 00	1.8	86.9	
			672 00			
						112.4
.09	Mar. 1, 12 a. m.	Mar. 31, 12 p. m.	744 00	1.8	110.7	
						110.7
.10	Apr. 1, 12 a. m.	Apr. 17, 4 p. m.	400 00	2.1	69.4	
.28	17, 4 p. m.	18, 5.15 p. m.	25 15	10.0	20.9	
.41	18, 5.15 p. m.	24, 4.35 p. m.	143 20	17.7	209.7	
.53	24, 4.35 p. m.	25, 5.30 p. m.	24 55	26.0	53.5	
.65	25, 5.30 p. m.	30, 5.15 p. m.	119 45	35.3	349.2	
.71	30, 5.15 p. m.	30, 6.30 p. m.	1 15	40.3	4.2	
.78	30, 6.30 p. m.	30, 12 p. m.	5 30	46.4	21.1	
			720 00			
						728.0
.78	May 1, 12 a. m.	May 1, 6 p. m.	18 00	46.4	69.0	
.93	1, 6 p. m.	2, 10 p. m.	28 00	60.4	139.8	
1.03	2, 10 p. m.	3, 7 p. m.	21 00	70.4	122.2	
.35	3, 7 p. m.	4, 7.45 p. m.	24 45	13.9	28.4	
.83	4, 7.45 p. m.	5, 7.30 p. m.	23 45	50.9	99.9	
1.03	5, 7.30 p. m.	7, 9.30 a. m.	38 00	70.4	221.1	
.29	7, 9.30 a. m.	8, 8.20 p. m.	34 50	10.5	30.2	
.95	8, 8.20 p. m.	12, 7.40 p. m.	95 20	62.3	490.8	
.80	12, 7.40 p. m.	16, 10.20 a. m.	86 40	48.2	345.3	
.30	16, 10.20 a. m.	18, 12 m.	49 40	11.1	45.6	
.18	18, 12 m.	21, 8.20 p. m.	80 20	5.1	33.9	
.52	21, 8.20 p. m.	22, 9 p. m.	24 40	25.2	51.4	
.61	22, 9 p. m.	23, 8.10 p. m.	23 10	32.1	61.6	
.80	23, 8.10 p. m.	25, 9 p. m.	48 50	48.2	194.5	
.94	25, 9 p. m.	30, 8.45 p. m.	119 45	61.4	607.7	
.98	30, 8.45 p. m.	31, 12 p. m.	27 15	65.3	147.1	
			744 00			
						2,668.5
.98	June 1, 12 a. m.	June 1, 8.30 p. m.	20 30	65.3	110.6	
1.12	1, 8.30 p. m.	2, 10 p. m.	25 30	79.8	168.2	
1.18	2, 10 p. m.	2, 11.30 p. m.	1 30	86.3	10.7	
1.27	2, 11.30 p. m.	4, 9 p. m.	45 30	96.4	362.5	
1.30	4, 9 p. m.	5, 11.15 a, m.	14 15	99.8	117.5	
1.27	5, 11.15 a. m.	5, 9.30 p. m.	10 15	96.4	81.6	
1.29	5, 9.30 p. m.	6, 9 p. m.	23 30	98.7	191.7	
1.31	6, 9 p. m.	9, 9.10 p. m.	72 10	101.0	602.4	
1.26	9, 9.10 p. m.	11, 7.45 p. m.	46 35	95.2	366.6	
.28	11, 7.45 p. m.	13, 8.25 p. m.	48 40	10.0	40.2	
.32	13, 8.25 p. m.	14, 9 p. m.	24 35	12.2	24.8	
.72	14, 9 p. m.	15, 8.50 p. m.	23 50	41.1	80.9	
.89	15, 8.50 p. m.	16, 9 p. m.	24 10	56.5	112.8	
1.09	16, 9 p. m.	17, 8.50 p. m.	23 50	76.6	150.9	
1.26	17, 8.50 p. m.	17, 10 p. m.	1 10	95.2	9.2	
1.33	17, 10 p. m.	22, 2.25 p. m.	112 25	103.3	959.7	
1.30	22, 2.25 p. m.	23, 2.20 p. m.	23 55	99.8	197.1	
.82	23, 2.20 p. m.	27, 7 a, m.	88 40	50.0	366.4	
.45	27, 7 a. m.	28, 8.30 a. m.	25 30	20.3	42.7	
.36	28, 8.30 a. m.	28, 7.40 p. m.	11 10	14.5	13.4	
.27	28, 7.40 p. m.	30, 12 p. m.	52 20	9.4	40.6	
			720 00			
						4,050.5

Daily gage height, in feet, and discharge, in second-feet, of 20-foot Cippoletti weir at Conconully dam, near Okanogan, Wash., for the year ending Sept. 30, 1911—Continued.

Mean gage heights.	Day.		Length of run.	Discharge.		
	From—	To—		Second-feet.	Total acre-feet.	Acre-feet for month.
			Hrs. m.			
0.27	July 1, 12 a. m.	July 1, 7.25 p. m.	19 25	9.4	15.0	....
.37	1, 7.25 p. m.	4, 8.45 p. m.	73 20	15.2	92.1	....
.82	4, 8.45 p. m.	5, 8.45 p. m.	24 00	50.0	99.2	....
1.20	5, 8.45 p. m.	6, 9 p. m.	24 15	88.5	177.3	....
1.32	6, 9 p. m.	8, 8.15 p. m.	47 15	102.1	398.7	....
1.30	8, 8.15 p. m.	9, 12.15 p. m.	16 00	99.8	132.0	....
1.28	9, 12.15 p. m.	12, 8.20 p. m.	80 5	97.5	645.2	....
1.22	12, 8.20 p. m.	14, 8.20 p. m.	48 00	90.7	359.8	....
1.25	14, 8.20 p. m.	15, 9.30 p. m.	25 10	94.1	195.7	....
1.26	15, 9.30 p. m.	16, 10.30 a. m.	13 00	95.2	102.3	....
1.23	16, 10.30 a. m.	18, 8.40 p. m.	58 10	91.9	441.7	....
1.25	18, 8.40 p. m.	19, 9.30 p. m.	24 50	94.1	193.1	....
1.30	19, 9.30 p. m.	20, 9 p. m.	23 30	99.8	193.8	....
1.33	20, 9 p. m.	21, 9.40 p. m.	24 40	103.3	210.6	....
1.36	21, 9.40 p. m.	23, 9.15 a. m.	35 35	106.8	314.2	....
1.12	23, 9.15 a. m.	23, 10.20 p. m.	13 5	79.8	86.2	....
1.36	23, 10.20 p. m.	26, 9 p. m.	70 40	106.8	623.7	....
1.31	26, 9 p. m.	27, 8.10 p. m.	23 10	101.0	193.4	....
1.26	27, 8.10 p. m.	29, 8 p. m.	47 50	95.2	376.3	....
1.24	29, 8 p. m.	30, 1.10 p. m.	17 10	93.0	131.9	....
.82	30, 1.10 p. m.	30, 2 p. m.	00 50	50.0	3.4	....
.58	30, 2 p. m.	30, 2.50 p. m.	00 50	29.7	2.0	....
.37	30, 2.50 p. m.	31, 12 p. m.	33 10	15.2	41.7	....
			744 00			
						5,029.3
.37	Aug. 1, 12 a. m.	Aug. 1, 6.50 p. m.	18 50	15.2	23.6	....
.35	1, 6.50 p. m.	3, 9.15 a. m.	38 25	13.9	44.1	....
.59	3, 9.15 a. m.	3, 9 p. m.	11 45	30.5	29.6	....
1.24	3, 9 p. m.	5, 2 p. m.	41 00	93.0	315.1	....
.58	5, 2 p. m.	6, 2.45 p. m.	24 45	29.7	60.7	....
.48	6, 2.45 p. m.	7, 5.30 p. m.	26 45	22.4	49.5	....
.41	7, 5.30 p, m.	10, 8 a. m.	62 30	17.7	91.4	....
.39	10, 8 a. m.	12, 7.45 a. m.	47 45	16.4	64.7	....
.28	12, 7.45 a. m.	13, 8 a. m.	24 15	10.0	20.0	....
.18	13, 8 a. m.	18, 8.20 p. m.	132 20	5.1	55.8	....
.45	18, 8.20 p. m.	19, 6.30 p. m.	10 10	20.3	17.0	....
.43	19, 6.30 a. m.	19, 7.50 p. m.	13 20	19.0	20.9	....
.50	19, 7.50 p. m.	21, 8.40 p. m.	48 50	23.8	96.0	....
.45	21, 8.40 p. m.	24, 9 p. m.	72 20	20.3	121.3	....
.88	24, 9 p. m.	25, 8.15 p. m.	23 15	55.6	106.8	....
.94	25, 8.15 p. m.	28, 11.30 a. m.	63 15	61.4	321.0	....
.88	28, 11.30 a m.	30, 11.30 a. m.	48 00	55.6	220.6	....
.66	30, 11.30 a. m.	31, 7.45 a. m.	20 15	36.1	60.4	....
.16	31, 7.45 a. m.	31, 12 p. m.	16 15	4.3	5.8	....
			744 00			
						1,724.3
.16	Sept. 1, 12 a. m.	Sept. 2, 6 p. m.	42 00	4.3	14.9	....
.12	2, 6 p. m.	6, 4 p. m.	94 00	2.8	21.7	....
.11	6, 4 p. m.	7, 9.10 p. m.	17 10	2.5	3.5	....
.07	7, 9.10 a. m.	14, 1 p. m.	171 50	1.2	17.0	....
.03	14, 1 p. m.	30, 12 m.	395 00	0.4	13.1	....
			720 00			70.2

Monthly discharge of Salmon Creek near Okanogan, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
October	6.0	0.0	2.67	164
November	1.5	1.5	1.50	90
December	1.5	1.5	1.50	93
January	3.5	1.0	2.54	156
February	3.5	1.8	2.02	112
March	1.8	1.8	1.80	111
April	46.4	2.1	12.2	728
May	70.4	5.1	43.4	2,670
June	103	9.4	68.1	4,050
July	107	9.4	81.8	5,030
August	93.0	4.3	28.0	1,720
September	4.2	.4	1.18	70
The year	107	.0	20.6	15,000

NOTE.—Discharge computed from weir records.

METHOW RIVER AT PATEROS, WASH.

Location.—In sec. 35, T. 30 N., R. 23 E., three-fourths of a mile above the old county bridge at Pateros.

Records available.—May 3, 1903, to September 30, 1911.

Drainage area.—1,850 square miles.

Gage.—Inclined staff on left bank.

Channel.—Gravel and small bowlders; practically permanent.

Discharge measurements.—Made from a cable 500 feet above the gage.

Winter flow.—Seriously affected by ice and estimated from a study of discharge measurements, observer's notes, and weather records.

Accuracy.—Results good.

The following discharge measurement was made by F. C. Ebert: December 11, 1910: Gage height, 4.26 feet; discharge, 530 second-feet.

Daily gage height, in feet, of Methow River at Pateros, Wash., for the year ending Sept. 30, 1911.

[F. W. Robinson, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	4.15	4.80	4.35	4.00	4.55	4.25	5.35	6.3	9.2	7.2	5.00	4.20
2	4.20	4.77	4.36	3.90	4.50	4.30	5.40	6.5	10.0	7.1	5.00	4.20
3	4.30	4.75	4.39	3.95	4.55	4.35	5.40	6.6	9.6	7.0	5.00	4.20
4	4.38	4.70	4.36	4.00	4.55	4.35	5.35	6.7	9.0	6.8	5.00	4.30
5	4.40	4.67	5.31	4.05	4.55	4.30	5.30	6.8	8.4	6.7	5.00	4.55
6	4.33	4.65	4.32	4.40	4.55	4.30	5.30	6.8	8.2	6.8	4.95	4.70
7	4.42	4.70	4.34	4.35	4.60	4.20	5.20	6.7	8.2	6.7	5.10	4.65
8	4.54	4.74	4.34	4.25	4.60	4.15	5.10	6.7	8.2	6.6	5.00	4.65
9	4.65	4.70	4.32	4.20	4.60	4.10	5.10	6.6	8.2	6.4	5.00	4.65
10	4.85	4.65	4.28	4.20	4.55	4.05	5.15	6.4	8.2	6.2	4.90	4.70
11	4.85	4.66	4.27	4.00	4.55	4.00	5.10	6.3	9.0	6.1	4.80	4.65
12	4.82	4.62	4.24	3.85	4.50	3.95	5.05	6.3	10.4	6.1	4.70	4.65
13	4.77	4.57	4.24	3.85	4.55	3.90	5.00	6.3	10.9	6.0	4.65	4.65
14	4.75	4.55	4.24	3.70	4.60	3.90	5.00	6.4	10.7	6.0	4.65	4.70
15	4.72	4.53	4.22	3.85	4.65	3.90	5.00	6.4	10.2	6.1	4.60	4.70
16	4.80	4.50	4.22	4.40	4.65	3.90	5.00	6.9	9.9	6.1	4.55	4.75
17	4.85	4.47	4.21	4.55	4.70	3.95	5.00	7.3	9.3	6.00	4.50	4.70
18	4.97	4.47	4.16	4.60	4.85	4.00	5.05	7.3	8.8	6.00	4.45	4.65
19	4.97	4.47	4.20	4.60	4.60	4.05	5.05	7.2	8.3	5.90	4.40	4.65
20	....	4.50	4.18	4.60	4.50	4.10	5.05	7.1	8.0	5.80	4.40	4.60
21	4.87	4.58	4.16	4.55	4.40	4.15	5.10	7.1	7.8	5.70	4.40	4.55
22	4.80	4.60	4.13	4.50	4.30	4.30	5.20	7.3	8.0	5.60	4.40	4.50
23	4.74	4.65	4.14	4.50	4.30	4.45	5.30	7.3	8.3	5.50	4.40	4.50
24	4.70	4.50	4.14	4.45	4.25	4.75	5.55	7.1	8.1	5.40	4.40	4.45
25	4.80	4.42	4.08	4.50	4.15	4.90	5.95	6.9	7.8	5.35	4.35	4.45
26	5.12	4.20	4.02	4.60	4.20	4.90	6.2	6.8	7.8	5.35	4.30	4.45
27	5.07	4.31	4.07	4.55	4.20	4.90	6.2	6.7	7.8	5.30	4.30	4.45
28	4.98	4.39	4.08	4.60	4.25	4.85	6.1	6.7	7.7	5.20	4.25	4.40
29	4.97	4.36	4.16	4.60	....	4.85	6.1	6.7	7.5	5.10	4.25	4.35
30	4.93	4.36	4.16	4.60	....	4.95	6.2	7.1	7.3	5.05	4.20	4.35
31	4.92	....	4.12	4.55	....	5.15	....	8.0	....	5.00	4.20	....

NOTE.—Ice along banks Dec. 23-31, 1910. River frozen over Jan. 1 to Mar. 4, 1911, and gage heights seriously affected.

Daily discharge, in second-feet, of Methow River at Pateros, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	470	480	565	....	....	....	1,360	2,760	8,950	4,480	1,000	490
2	490	819	570	....	....	....	1,410	3,100	10,900	4,270	1,000	490
3	540	805	585	....	....	....	1,410	3,280	9,910	4,060	1,600	490
4	580	770	570	....	....	....	1,360	3,470	8,480	3,660	1,000	540
5	590	750	545	....	....	540	1,300	3,660	7,100	3,470	1,000	675
6	555	738	550	....	....	540	1,300	3,660	6,640	3,660	958	770
7	601	770	560	....	....	490	1,190	3,470	6,640	3,470	1,090	738
8	669	798	560	....	....	470	1,090	3,470	6,640	3,280	1,000	738
9	738	770	550	....	....	450	1,090	3,280	6,640	2,930	1,000	738
10	878	744	530	....	....	430	1,140	2,930	6,640	2,590	915	770
11	878	744	525	....	....	410	1,090	2,760	8,480	2,420	840	738
12	855	718	510	....	....	390	1,040	2,760	11,800	2,420	770	738
13	819	687	510	....	....	370	1,000	2,760	13,000	2,250	738	738
14	805	675	510	....	....	370	1,000	2,930	12,600	2,250	738	770
15	784	663	500	....	....	370	1,000	2,930	11,400	2,420	705	770
16	840	645	500	....	....	370	1,000	3,860	10,600	2,420	675	805
17	878	628	495	....	....	390	1,000	4,690	9,190	2,250	645	770
18	974	628	474	....	....	410	1,040	4,690	8,020	2,250	618	738
19	974	628	490	....	....	430	1,040	4,480	6,870	2,090	590	738
20	932	645	482	....	....	450	1,040	4,270	6,190	1,940	590	705
21	892	693	474	....	....	470	1,090	4,270	5,750	1,800	590	675
22	840	705	462	....	....	540	1,190	4,690	6,190	1,660	590	645
23	798	738	466	....	....	618	1,300	4,690	6,870	1,530	590	645
24	770	645	466	....	....	805	1,600	4,270	6,410	1,410	590	618
25	840	601	442	....	....	915	2,170	3,860	5,750	1,360	565	618
26	1,110	490	418	....	....	915	2,590	3,660	5,750	1,360	540	618
27	1,060	545	438	....	....	915	2,590	3,470	5,750	1,300	540	618
28	983	585	442	....	....	878	2,420	3,470	5,530	1,190	515	590
29	974	570	474	....	....	878	2,420	3,470	5,110	1,090	515	565
30	940	570	474	....	....	958	2,590	4,270	4,690	1,040	490	565
31	932	....	458	....	....	1,140	....	6,190	....	1,000	490	....

NOTE.—Discharge determined from a well-defined rating curve. Discharge not estimated Jan. 1 to Mar. 4, 1911, when gage heights were seriously affected by ice.

Monthly discharge of Methow River at Pateros, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	1,110	470	806	49,600	A.
November	840	490	687	40,900	A.
December	585	418	503	30,900	B.
March 5-31	1,140	370	589	31,500	A.
April	2,590	1,000	1,430	85,100	A.
May	6,190	2,760	3,730	229,000	A.
June	13,000	4,690	7,820	465,000	A.
July	4,480	1,000	2,370	146,000	A.
August	1,000	490	738	45,400	A.
September	805	490	670	39,900	A.

STEHEKIN RIVER AT STEHEKIN, WASH.

Location.—At the pipe-line trestle of Hotel Fields, at Stehekin, three-eighths of a mile above Lake Chelan.

Records available.—December 6, 1910, to September 30, 1911.

Drainage area.—368 square miles.

Gage.—Vertical staff on right bank, at pipe-line trestle until June 12, 1911. After June 13, 1911, an inclined staff on the left bank, 1 mile above the former location.

Channel.—Shifting gravel and sand.

Discharge measurements.—Made by wading.

Winter flow.—Not seriously affected by ice.

Accuracy.—Results good.

Discharge measurements of Stehekin River at Stehekin, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.		Discharge.
		Old.	New.	
		Feet.	*Feet.*	*Sec.-ft.*
1910. Dec. 7	F. C. Ebert	1.00		665
1911. Aug. 15	G. L. Parker	1.61	1.70	1,010
Sept. 28	R. C. Pierce		.86	446

Daily gage height, in feet, of Stehekin River at Stehekin, Wash., for the year ending Sept. 30, 1911.

[Bernard Zell, observer.]

Day..	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	0.5	0.5	0.5	2.0	2.8	5.2	2.9	2.2	2.1
2	....	.5	.5	.5	2.0	3.0	4.3	2.9	2.1	2.1
3	....	.5	.5	.5	1.9	3.4	3.6	2.9	2.2	2.1
4	....	.5	.5	.5	1.8	3.7	3.4	3.0	2.1	2.0
5	....	.5	.5	....	1.6	3.6	3.4	3.3	2.1	2.0
6	....	.6	.5	....	1.5	3.4	3.5	3.2	2.0	1.8
7	1.0	.7	.5	....	1.5	3.0	3.5	3.0	1.9	1.7
8	1.0	.7	.5	....	1.4	3.0	3.5	3.3	1.8	1.5
9	1.1	.7	.5	....	1.5	3.0	3.6	2.8	1.8	1.5
10	1.1	.6	.5	....	1.5	2.8	4.0	2.4	1.8	1.6
11	1.1	.5	.5	....	1.5	2.6	5.4	2.4	1.8	2.0
12	1.1	.4	.5	.5	1.4	2.6	6.0	2.6	1.8	2.1
13	1.0	.4	.5	.7	1.5	2.8	6.0	3.2	1.8	2.1
14	1.0	.3	.5	.7	1.5	2.9	5.0	3.3	1.8	1.8
15	.9	.3	.5	.7	1.5	3.0	4.9	3.6	1.8	1.7
16	.9	.3	.5	.7	1.5	3.5	4.5	3.9	1.8	1.6
17	.9	.4	.5	.8	1.5	3.5	4.1	3.7	1.8	1.5
18	.7	.4	.5	.9	1.5	3.5	3.9	3.3	1.8	1.5
19	.7	.4	.5	1.0	1.5	3.5	3.6	3.2	2.0	1.4
20	.6	.5	.5	1.2	1.6	3.5	3.4	3.0	1.9	1.3
21	.6	.5	.5	1.4	1.9	3.4	3.4	2.7	1.7	1.3
22	.6	.5	.5	1.5	2.2	3.3	4.0	2.5	1.8	1.2
23	.6	.5	.5	1.6	2.5	3.2	3.6	2.5	1.8	1.1
24	.6	.5	.5	1.9	2.7	3.0	3.4	2.7	1.7	1.1
25	.6	.5	.5	1.9	3.3	2.8	3.4	3.1	1.6	1.0
26	.5	.5	.5	1.4	3.0	2.8	3.8	2.6	1.6	1.0
27	.5	.5	.5	1.4	2.8	2.8	3.3	2.4	1.6	.9
28	.5	.5	.5	1.4	2.8	3.0	3.1	2.4	1.5	.9
29	.5	.5	....	1.4	2.8	3.3	2.9	2.5	1.6	.8
30	.5	.5	....	1.8	2.8	3.9	2.8	2.4	2.0	.8
31	.5	.5	....	2.0	....	4.9	....	2.1	2.1	....

Daily discharge, in second-feet, of Stehekin River at Stehekin, Wash., for the year ending Sept. 30, 1911.

Day.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	320	320	320	1,840	3,280	9,190	2,980	1,760	1,370
2	....	320	320	320	1,840	3,700	6,780	2,980	1,620	1,370
3	....	320	320	320	1,700	4,580	5,040	2,980	1,760	1,370
4	....	320	320	320	1,560	5,280	4,580	3,180	1,620	1,280
5	....	320	320	292	1,310	5,040	4,580	3,830	1,620	1,280
6	....	380	320	264	1,190	4,580	4,800	3,610	1,490	1,100
7	670	450	320	236	1,190	3,700	4,800	3,180	1,360	1,010
8	670	450	320	206	1,070	3,700	4,800	3,830	1,240	840
9	760	450	320	178	1,190	3,700	5,040	2,790	1,240	840
10	760	380	320	150	1,190	3,280	6,000	2,070	1,240	920
11	760	320	320	235	1,190	2,880	9,730	2,070	1,240	1,280
12	760	270	320	320	1,070	2,880	11,400	2,420	1,240	1,370
13	670	270	320	450	1,190	3,280	10,800	3,610	1,240	1,370
14	670	230	320	450	1,190	3,480	8,040	3,830	1,240	1,100
15	590	230	320	450	1,190	3,700	7,770	4,490	1,240	1,010
16	590	230	320	450	1,190	4,800	6,690	5,190	1,240	920
17	590	270	320	520	1,190	4,800	5,670	4,720	1,240	840
18	450	270	320	590	1,190	4,800	5,190	3,830	1,240	840
19	450	270	320	670	1,190	4,800	4,490	3,610	1,280	760
20	380	320	320	860	1,310	4,800	4,050	3,180	1,190	690
21	380	320	320	1,070	1,700	4,580	4,050	2,600	1,010	690
22	380	320	320	1,190	2,150	4,360	5,430	2,240	1,100	620
23	380	320	320	1,310	2,680	4,140	4,490	2,240	1,100	560
24	380	320	320	1,700	3,080	3,700	4,050	2,600	1,010	560
25	380	320	320	1,700	4,360	3,280	4,050	3,390	920	500
26	320	320	320	1,070	3,700	3,280	4,950	2,420	920	500
27	320	320	320	1,070	3,280	3,280	3,830	2,070	920	448
28	320	320	320	1,070	3,280	3,700	3,390	2,070	840	448
29	320	320	....	1,070	3,280	4,360	2,980	2,240	920	398
30	320	320	....	1,560	3,280	5,760	2,790	2,070	1,280	398
31	320	320	....	1,840	....	8,380	....	1,620	1,370	....

NOTE.—Discharge Dec. 7, 1910, to June 12, 1911, determined from a rating curve fairly well defined between 500 and 5,000 second-feet. Discharge June 13 to Aug. 18, 1911, determined from a rating curve fairly well defined below 5,000 second-feet. Discharge Aug. 19 to Sept. 30, 1911, determined from a rating curve well defined below 5,000 second-feet.

Monthly discharge of Stehekin River at Stehekin, Wash., for the year ending Sept. 30, 1911.

[Drainage area, 368 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
December 7-31	760	320	504	1.37	1.27	25,000	B.
January	450	230	320	.870	1.00	19,700	B.
February	320	320	320	.870	.91	17,800	B.
March	1,840	150	718	1.95	2.25	44,100	B.
April	4,360	1,070	1,890	5.14	5.74	112,000	B.
May	8,380	2,880	4,190	11.4	13.14	258,000	B.
June	11,400	2,790	5,650	15.4	17.18	336,000	B.
July	5,190	1,620	3,030	8.23	9.49	186,000	B.
August	1,760	840	1,250	3.40	3.92	76,900	B.
September	1,870	398	889	2.42	2.70	52,900	A.
The period						1,130,000	

LAKE CHELAN AT CHELAN, WASH.

Location.—In sec. 13, T. 27 N., R. 22 E., at the Forest Service boat landing at Chelan, one-fourth mile above the highway bridge at the outlet.

Records available.—December 5, 1910, to September 30, 1911.

Drainage area.—950 square miles.

Gage.—Vertical staff.

Regulation.—The height of water in the lake is regulated by operation of gates in the dam at the outlet.

Cooperation.—Gage heights furnished by United States Forest Service.

Daily gage height, in feet, of Lake Chelan at Chelan, Wash., for the year ending Sept. 30, 1911.

Day.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1		1.9	2.4	2.3	2.7	2.5	3.9	4.8	3.8	3.4
2		1.85	2.3	2.3	2.6	2.5	4.3	4.6	3.85	3.4
3		1.7	2.2	2.45	2.6	2.65		4.5	3.9	
4		1.6	2.2	2.4	2.5	2.8	4.5	4.4	3.85	3.4
5	1.6	1.8			2.4	2.9	4.5	4.3	3.8	3.4
6		2.0	2.35	2.45	2.4	2.9	4.5	4.2		3.6
7		2.0		2.5	2.35	3.0	4.4	4.3	3.8	3.65
8				2.45	2.3	3.0	4.4	4.2		3.7
9		2.0	2.4	2.45		3.0	4.4		3.7	3.7
10		1.9	2.4	2.6	2.1	3.0	4.5	4.0	3.7	
11	1.4	1.9	2.4	2.45	2.1	3.0	4.6	3.85	3.7	3.65
12	1.4			2.45	2.1	3.0	5.1	3.8	3.65	
13	1.4		2.45	2.45	2.1	3.0	5.45	3.7		
14	1.4		2.4	2.5	2.0	2.95	5.8	3.7	3.5	
15	1.5		2.3	2.55	2.0	2.95	6.0	3.7	3.5	
16	1.6		2.4	2.6		2.95	6.1		3.4	
17	1.6		2.4	2.6	1.95	3.0	6.1	3.8	3.4	
18			2.4	2.5	1.95	3.1	6.0	3.9	3.4	
19		2.2	2.5		1.9	3.2	5.9	4.0	3.4	
20	1.6	2.2	2.5	2.65		3.2	5.7	4.0		
21	1.65	2.3	2.4	2.7	1.85		5.6	4.0	3.3	
22	1.6	2.3	2.4	2.75	1.8	3.2	5.7	3.95	3.2	
23	1.7	2.2	2.4		1.9	3.3	5.5		3.3	3.5
24	1.7	2.3	2.4	3.0	1.9	3.15	5.4	3.85	3.3	
25	1.7	2.25	2.4	3.0	2.1	3.2		3.9	3.2	3.5
26	1.7	2.15			2.15	3.2	5.1	3.95	3.2	3.4
27	1.7	2.2	2.4	2.85	2.25	3.2	5.2	3.9		3.4
28	1.8	2.3	2.4	2.8	2.3		5.1	3.9	3.25	3.4
29	1.8	2.2		2.7	2.4	3.3	5.0	3.9	3.3	3.4
30	1.8	2.2		2.7			4.9		3.3	3.4
31	1.8	2.3		2.65		3.55		3.85	3.4	

CHELAN RIVER AT CHELAN, WASH.

Location.—In sec. 13, T. 27 N., R. 22 E., at Chelan, 3,000 feet below the outlet of the lake, and 4 miles above Chelan Falls.

Records available.—November 6, 1903, to September 30, 1911.

Drainage area.—950 square miles.

Gage.—Vertical staff.

Channel.—Rocks and clay; practically permanent.

Discharge measurements.—Made from a new highway bridge at the outlet.

Winter flow.—Not seriously affected by ice.

Regulation.—Flow partly controlled by storage in Lake Chelan.

Accuracy.—Results good.

Discharge measurements of Chelan River at Chelan, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
1910.				1911.			
Dec. 4	F. C. Ebert	6.15	1,430	Aug. 18	W. W. Clifford	6.58	1,900
				18	G. L. Parker	6.57	1,890
1911.				Sept. 27	R. C. Pierce	5.58	921
Mar. 27	F. C. Ebert	6.23	1,420	30	.....do	5.45	728
May 3	.....do	7.15	2,700				

Daily gage height, in feet, of Chelan River at Chelan, Wash., for the year ending Sept. 30, 1911.

[Clyde Farley, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	5.6	6.8	6.5	4.55	4.35	4.55	7.1	7.0	8.7	9.0	7.0	5.55
2	5.65	6.75	6.45	4.50	4.40	4.60	7.1	7.0	8.8	9.0	7.0	5.55
3	7.75	6.7	6.35	4.45	4.45	4.55	7.0	7.1	9.0	9.0	7.0	5.60
4	7.85	6.6	6.2	4.40	4.50	4.50	7.0	7.2	9.0	9.0	7.1	5.60
5	7.85	6.55	6.25	4.45	4.55	4.55	7.0	7.2	8.9	8.8	7.0	5.65
6	7.8	6.6	6.2	4.50	4.50	4.55	6.9	7.2	9.0	8.8	7.0	5.65
7	7.75	6.65	6.15	4.55	4.45	4.60	6.9	7.3	9.0	8.8	7.0	5.70
8	7.8	6.6	6.1	4.50	4.50	4.55	7.0	7.4	9.0	8.8	7.0	5.75
9	7.75	6.55	6.05	4.45	4.45	4.60	6.9	7.4	9.0	8.6	7.0	5.80
10	7.7	6.5	6.0	4.40	4.50	4.55	6.8	7.4	9.2	8.5	7.0	5.85
11	7.65	6.55	5.95	4.45	4.55	4.50	6.8	7.5	9.2	8.4	7.0	5.85
12	7.6	6.6	6.0	4.40	4.55	4.55	6.8	7.6	9.4	8.4	7.0	5.90
13	7.55	6.65	5.95	4.45	4.60	4.60	6.8	7.6	9.4	8.2	6.9	5.95
14	7.45	6.6	5.9	4.40	4.55	4.55	6.7	7.6	9.5	8.2	6.8	6.0
15	6.35	6.55	4.75	4.40	4.50	4.50	6.7	7.6	9.6	8.0	6.8	6.0
16	7.2	6.5	4.65	4.35	4.45	4.45	6.6	7.5	9.7	8.0	6.8	6.0
17	7.15	6.55	4.35	4.30	4.40	4.50	6.7	7.4	10.0	7.9	6.7	5.90
18	7.2	6.6	4.4	4.25	4.45	4.50	6.8	7.5	10.0	7.9	6.6	5.85
19	7.25	6.65	4.45	4.30	4.50	4.55	6.8	7.6	9.9	7.8	6.6	5.85
20	7.2	6.7	4.5	4.35	4.55	4.60	6.8	7.6	9.9	7.8	6.6	5.80
21	7.15	6.6	4.55	4.30	4.60	4.65	6.8	7.6	9.8	7.8	6.6	5.75
22	7.1	6.55	4.7	4.35	4.55	5.00	6.8	7.6	9.9	7.6	6.6	5.65
23	7.0	6.5	4.8	4.30	4.50	5.15	6.7	7.7	9.8	7.6	6.6	5.60
24	6.95	6.45	4.9	4.25	4.55	5.25	6.6	7.8	9.9	7.4	6.6	5.70
25	7.0	6.4	4.85	4.30	4.50	6.0	6.7	7.8	9.8	7.4	6.6	5.70
26	7.0	6.35	4.8	4.35	4.45	6.0	6.8	7.7	9.7	7.2	6.6	5.60
27	6.95	6.4	4.75	4.40	4.40	6.1	6.8	8.0	9.6	7.2	6.5	5.50
28	6.9	6.45	4.8	4.45	4.35	6.4	6.8	8.2	9.5	7.2	5.60	5.50
29	6.95	6.5	4.7	4.40	......	6.6	6.9	8.2	9.4	7.1	5.50	5.40
30	6.9	6.55	4.65	4.35	......	6.8	7.0	8.4	9.4	7.0	5.55	5.40
31	6.85	......	4.6	4.30	......	7.0	......	8.6	......	7.0	5.55	......

Daily discharge, in second-feet, of Chelan River at Chelan, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	900	2,220	1,810	372	810	372	2,680	2,520	5,530	6,120	2,520	868
2	940	2,150	1,740	355	324	388	2,680	2,520	5,720	6,120	2,520	868
3	3,760	2,080	1,620	340	340	372	2,520	2,680	6,120	6,120	2,520	904
4	3,940	1,940	1,450	324	355	355	2,520	2,840	6,120	6,120	2,680	904
5	3,940	1,880	1,500	340	372	372	2,520	2,840	5,920	5,720	2,520	942
6	3,850	1,940	1,450	355	355	372	2,370	2,840	6,120	5,720	2,520	942
7	3,760	2,010	1,400	372	340	388	2,370	3,000	6,120	5,720	2,520	980
8	3,850	1,940	1,340	855	355	372	2,520	3,170	6,120	5,720	2,520	1,020
9	3,760	1,880	1,290	340	340	388	2,370	3,170	6,120	5,340	2,520	1,060
10	3,680	1,810	1,240	324	355	872	2,220	3,170	6,520	5,150	2,520	1,100
11	3,600	1,880	1,200	340	372	355	2,220	3,340	6,520	4,960	2,520	1,100
12	3,510	1,940	1,240	324	372	372	2,220	3,510	6,930	4,960	2,520	1,150
13	3,420	2,010	1,200	340	388	388	2,220	3,510	6,930	4,580	2,370	1,200
14	3,260	1,940	1,150	324	372	372	2,080	3,510	7,140	4,580	2,220	1,240
15	3,080	1,880	395	324	355	355	2,080	3,510	7,350	4,210	2,220	1,240
16	2,840	1,810	350	310	340	340	1,940	3,340	7,570	4,210	2,220	1,240
17	2,760	1,880	245	296	324	355	2,080	3,170	8,230	4,030	2,080	1,150
18	2,840	1,940	260	283	340	355	2,220	3,340	8,230	4,030	1,940	1,100
19	2,920	2,010	275	296	355	372	2,220	3,510	8,010	3,850	1,940	1,100
20	2,840	2,080	290	310	372	388	2,220	3,510	8,010	3,850	1,940	1,060
21	2,760	1,940	310	296	388	406	2,220	3,510	7,790	3,850	1,940	1,020
22	2,680	1,880	370	310	372	550	2,220	3,510	8,010	3,510	1,940	942
23	2,520	1,810	420	296	355	524	2,080	3,680	7,790	3,510	1,940	904
24	2,440	1,740	470	283	372	678	1,940	3,850	8,010	3,170	1,940	980
25	2,520	1,680	445	296	355	1,240	2,080	3,850	7,790	3,170	1,940	980
26	2,520	1,620	420	310	340	1,240	2,220	3,680	7,570	2,840	1,940	904
27	2,440	1,680	395	324	324	1,340	2,220	4,210	7,350	2,840	1,810	833
28	2,370	1,740	420	340	310	1,680	2,220	4,580	7,140	2,840	904	833
29	2,440	1,810	370	324	....	1,940	2,370	4,580	6,930	2,680	833	767
30	2,370	1,880	350	310	....	2,220	2,520	4,960	6,930	2,520	868	767
31	2,300	....	330	296	....	2,520	....	5,340	....	2,520	868	....

NOTE.—Discharge determined from a well-defined rating curve.

Monthly discharge of Chelan River at Chelan, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	3,940	900	2,930	180,000	B.
November	2,220	1,620	1,900	113,000	A.
December	1,810	245	830	51,000	C.
January	372	283	323	19,900	C.
February	388	310	352	19,500	C.
March	2,520	340	701	43,100	B.
April	2,680	1,940	2,280	136,000	A.
May	5,340	2,520	3,510	21,600	A.
June	8,230	5,530	7,020	418,000	A.
July	6,120	2,520	4,340	267,000	A.
August	2,680	833	2,070	127,000	A.
September	1,240	767	1,000	59,500	B.
The year	8,230	245	2,280	1,650,000	

RAILROAD CREEK AT LUCERNE, WASH.

Location.—At a trail bridge at Lucerne, just above the mouth.

Records available.—December 6, 1910, to September 30, 1911.

Drainage area.—64 square miles.

Gage.—Vertical staff on left abutment.

Channel.—Gravel and large bowlders; practically permanent.

Discharge measurements.—Made by wading.

Winter flow.—Somewhat affected by ice.

Diversions.—No diversions at present. The entire flow of the stream could be diverted a few miles above the station and stored in Dumpky Lake. From Dumpky Lake to Lake Chelan there is a fall of over 1,000 feet in 1½ miles.

Accuracy.—Results good.

Discharge measurements of Railroad Creek at Lucerne, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
1910.			
Dec. 7	F. C. Ebert	0.70	109
1911.			
Aug. 16	W. W. Clifford	1.12	192
Sept. 29	R. C. Pierce	.42	74

Daily gage height, in feet, of Railroad Creek at Lucerne, Wash., for the year ending Sept. 30, 1911.

[Mrs. Barbara Nicol, observer.]

Day.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	0.40	0.25	0.10	1.20	1.60	2.6	1.80	1.70	1.40
2	....	.40	.20	.10	1.20	1.60	2.6	1.80	1.60	1.40
3	....	.40	.20	.10	1.10	1.70	2.6	1.80	1.60	1.40
4	....	.40	.20	.10	1.10	1.80	2.7	1.70	1.50	1.40
5	....	.40	.20	.10	1.00	1.80	2.6	1.70	1.50	1.10
6	....	.40	.20	.10	.95	1.80	2.0	2.00	1.60	1.10
7	0.70	.50	.20	.10	.95	1.70	2.0	1.90	1.50	1.05
8	.75	.50	.25	.10	....	1.60	2.0	1.70	1.50	1.10
9	.70	.40	.25	.10	1.00	1.50	2.0	1.60	1.40	.90
10	.40	.40	.25	.10	1.00	1.60	2.0	1.70	1.40	.90
11	.60	.40	.25	.10	1.00	1.50	2.6	1.70	1.30	.95
12	.60	.50	.25	.10	.90	1.50	2.8	1.80	1.30	.90
13	.55	.40	.25	.10	.90	1.50	3.0	1.80	1.10	.95
14	.60	.30	.25	.15	.95	1.50	3.0	1.90	1.10	.90
15	.55	.30	.25	.20	.95	1.50	2.8	1.90	1.10	.90
16	.75	.30	.20	.20	.90	1.60	2.8	2.0	1.15	.90
17	.50	.30	.30	.30	.90	1.60	2.8	2.0	1.15	.90
18	.50	.30	.30	.30	.90	1.70	2.5	2.0	1.20	.90
19	.50	.30	.15	.50	.95	1.70	2.2	2.0	1.20	.90
20	.45	.30	.15	.50	.95	1.60	2.2	2.0	1.30	.70
21	.45	.30	.15	.60	1.00	1.60	2.2	2.0	1.30	.60
22	.50	.40	.15	.70	1.20	1.60	2.0	2.0	1.20	.60
23	.60	.40	.15	.80	1.20	1.60	2.0	1.90	1.20	.60
24	.60	.40	.15	.80	1.30	1.60	2.0	1.70	1.15	.55
25	.60	.30	.15	.75	1.50	1.60	2.0	1.90	1.15	.50
26	.50	.30	.10	.70	1.50	1.60	2.0	1.90	1.15	.50
27	.40	.30	.10	.70	1.50	1.70	2.0	1.70	1.10	.50
28	.50	.30	.10	.70	1.50	1.60	2.1	1.70	1.10	.50
29	.40	.30	....	.80	....	1.70	2.1	1.60	1.20	.40
30	.40	.30	....	.95	1.60	2.0	1.9	1.60	1.20	.40
31	.50	.30	....	1.10	....	2.4	....	1.60	1.30	....

Daily discharge, in second-feet, of Railroad Creek at Lucerne, Wash., for the year ending Sept. 30, 1911.

Day.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	68	52	40	212	325	716	391	357	265
2	....	68	47	40	212	325	716	391	325	265
3	....	68	47	40	188	357	716	391	325	265
4	....	68	47	40	188	391	760	357	295	265
5	....	68	47	40	166	391	716	357	295	188
6	....	68	47	40	156	391	467	467	325	188
7	110	81	47	40	156	357	467	427	295	177
8	118	81	52	40	161	325	467	357	295	188
9	110	68	52	40	166	295	467	325	265	146
10	68	68	52	40	166	325	467	357	265	146
11	95	68	52	40	166	295	716	357	238	156
12	95	81	52	40	146	295	806	391	238	146
13	88	68	52	40	146	295	900	391	188	156
14	95	57	52	44	156	295	900	427	188	146
15	88	57	52	47	156	295	806	427	188	146
16	118	57	47	47	146	325	806	467	200	146
17	81	57	57	57	146	325	806	467	200	146
18	81	57	57	57	146	357	672	467	212	146
19	81	57	44	81	156	357	547	467	212	146
20	74	57	44	81	156	325	547	467	238	110
21	74	57	44	95	166	325	547	467	238	95
22	81	68	44	110	212	325	467	467	212	95
23	95	68	44	127	212	325	467	427	212	95
24	95	68	44	127	238	325	467	357	200	88
25	95	57	44	118	295	325	467	427	200	81
26	81	57	40	110	295	325	467	427	200	81
27	68	57	40	110	295	357	467	357	188	81
28	81	57	40	110	295	325	507	357	188	81
29	68	57	....	127	310	357	507	325	212	68
30	68	57	....	156	325	467	427	325	212	68
31	81	57	....	188	....	630	....	325	238	....

NOTE.—Discharge determined from a rating curve well defined below 300 second-feet.

Monthly discharge of Railroad Creek at Lucerne, Wash., for the year ending Sept. 30, 1911.

[Drainage area, 64 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
Dec. 7-31	118	68	87.6	1.37	1.27	4,340	
January	81	57	63.9	.998	1.15	3,930	A.
February	57	40	47.8	.747	.78	2,650	A.
March	188	40	74.6	1.17	1.35	4,590	A.
April	325	146	198	3.09	3.45	11,800	B.
May	630	295	346	5.41	6.24	21,300	B.
June	900	427	608	9.50	10.60	36,200	B.
July	467	325	400	6.25	7.21	24,600	B.
August	357	188	240	3.75	4.32	14,800	B.
September	265	68	146	2.28	2.54	8,690	A.
The period	....	....	....	....	....	133,000	

ENTIAT RIVER AT ENTIAT, WASH.

Location.—In sec. 18, T. 25 N., R. 21 E., one-eighth mile below the power house of the Wenatchee Valley Gas & Electric Co., three-fourths of a mile above Entiat and about 1 mile above the mouth.

Records available.—October 5, 1910, to September 30, 1911.

Drainage area.—419 square miles.

Gage.—Inclined staff on left bank.

Channel.—Gravel and small bowlders; practically permanent.

Discharge measurements.—Made from private bridge 200 feet below the power house and about one-eighth mile above the gage.

Winter flow.—Seriously affected by ice.

Regulation.—Flow affected somewhat by changes in load when the power plant is in operation.

Accuracy.—Results good.

Cooperation.—Gage heights furnished by Wenatchee Valley Gas & Electric Co.

Discharge measurements of Entiat River at Entiat, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*
Dec. 2	F. C. Ebert	1.55	275
1911.			
Mar. 26	F. C. Ebert	1.70	320
Aug. 10	Parker and Clifford	1.51	270
Sept. 26	R. C. Pierce	1.22	145

Daily gage height, in feet, of Entiat River at Entiat, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1		1.5	1.6	1.1		1.05	2.0	2.6	3.6	2.5	1.6	1.35
2		1.5	1.6	1.05		1.1	2.0	2.6	3.8	2.5	1.6	1.35
3		1.5	1.6	1.2		1.15	2.0	2.6	3.6	2.5	1.5	1.4
4		1.5	1.5	1.6		1.15	1.9	2.7	3.4	2.4	1.6	1.35
5	1.4	1.45	1.5	1.6		1.15	1.9	2.7	3.2	2.4	1.6	1.4
6	1.3	1.5	1.5	1.6		1.15	1.8	2.7	3.1	2.4	1.6	1.4
7	1.65	1.5	1.5	1.5		1.2	1.7	2.6	3.2	2.4	1.5	1.4
8	1.6	1.5	1.5	1.4		1.15	1.7	2.6	3.1	2.3	1.5	1.4
9	1.75	1.6	1.5	1.35		1.15	1.8	2.6	3.2	2.2	1.4	1.4
10		1.6	1.45	1.25		1.2	1.9	2.4	3.2	2.1	1.4	1.4
11		1.6	1.4	1.2		1.15	1.8	2.4	3.4	2.0	1.45	1.35
12		1.5	1.4	4.2		1.15	1.8	2.4	3.9	2.0	1.45	1.35
13		1.5	1.4	5.4		1.15	1.8	2.4	4.0	2.0	1.45	1.45
14		1.5	1.4	3.5		1.2	1.75	2.4	4.0	2.0	1.35	1.4
15		1.5	1.4	6.3	1.6	1.25	1.75	2.4	3.7	2.1	1.25	1.5
16		1.5	1.4	5.0	1.4	1.25	1.75	2.6	3.5	2.2	1.2	1.4
17		1.5	1.4		1.4	1.3	1.8	2.6	3.4	2.2	1.2	1.4
18		1.5	1.4		1.4	1.4	1.8	2.7	3.2	2.1	1.2	1.4
19		1.5	1.35		1.25	1.45	1.8	2.6	3.1	2.1	1.3	1.35
20		1.5	1.3		1.3	1.5	1.8	2.6	3.0	2.0	1.4	1.3
21		2.0	1.3		1.25	1.6	1.9	2.6	2.9	2.0	1.3	1.3
22		1.9	1.3		1.2	1.65	2.0	2.8	3.0	1.9	1.3	1.3
23		1.8	1.3		1.15	1.8	2.1	2.8	3.0	1.9	1.35	1.3
24		1.7	1.3		1.15	1.8	2.2	2.7	2.9	1.8	1.2	1.25
25		1.7	1.2		1.2	1.75	2.4	2.7	2.8	1.8	1.2	1.25
26		1.7	1.35		1.1	1.75	2.5	2.6	2.8	1.8	1.25	1.25
27		1.7	1.35		1.05	1.7	2.5	2.6	2.9	1.7	1.3	1.25
28		1.7	1.35		1.05	1.7	2.5	2.6	2.8	1.7	1.3	1.25
29		1.7	1.3			1.7	2.5	2.6	2.6	1.7	1.3	1.2
30		1.6	1.3			1.8	2.5	2.8	2.5	1.7	1.35	1.2
31			1.3			1.9		3.1		1.6	1.35	

NOTE.—River frozen over Jan. 3 to Feb. 26, 1911, and gage heights seriously affected by ice.

Daily discharge, in second-feet, of Entiat River at Entiat, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1		245	285	125	112	112	515	1,050	2,380	950	285	195
2		245	285	112	112	125	515	1,050	2,710	950	285	195
3		245	285	112	112	138	515	1,050	2,380	950	245	210
4		245	245	112	112	138	450	1,160	2,070	850	285	195
5	210	228	245	112	112	138	450	1,160	1,780	850	285	210
6	180	245	245	112	112	138	390	1,160	1,640	850	285	210
7	310	245	245	112	112	150	335	1,050	1,780	850	245	210
8	285	245	245	112	112	138	335	1,060	1,640	760	245	210
9	362	285	245	112	112	138	390	1,050	1,780	670	210	210
10		285	228	112	112	150	450	850	1,780	590	210	210
11		285	210	112	112	138	390	850	2,070	515	228	195
12		245	210	112	112	138	390	850	2,880	515	228	195
13		245	210	112	112	138	390	850	3,060	515	228	228
14		245	210	112	112	150	362	850	3,060	515	195	210
15		245	210	112	112	165	362	850	2,540	590	165	245
16		245	210	112	112	165	362	1,050	2,220	670	150	210
17		245	210	112	112	180	390	1,050	2,070	670	150	210
18		245	210	112	112	210	390	1,160	1,780	590	150	210
19		245	195	112	112	228	390	1,050	1,640	590	180	195
20		245	180	112	112	245	390	1,050	1,510	515	210	180
21		515	180	112	112	285	450	1,050	1,390	515	180	180
22		450	180	112	112	310	515	1,270	1,510	450	180	180
23		390	180	112	112	390	590	1,270	1,510	450	195	180
24		335	180	112	112	390	670	1,160	1,390	390	150	165
25		335	150	112	112	362	850	1,160	1,270	390	150	165
26		335	195	112	112	362	950	1,050	1,270	390	165	165
27		335	195	112	112	335	950	1,050	1,390	335	180	165
28		335	195	112	112	335	950	1,050	1,270	335	180	165
29		335	180	112		335	950	1,050	1,050	335	180	150
30		285	180	112		390	950	1,270	950	335	195	150
31			180	112		450		1,640		285	195	

NOTE.—Discharge determined from a well-defined rating curve. Discharge Jan. 3 to Feb. 26, 1911, interpolated.

Monthly discharge of Entiat River at Entiat, Wash., for the year ending Sept. 30, 1911.

[Drainage area, 419 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
November	515	228	288	0.687	0.77	17,100	A.
December	285	150	213	.508	.59	13,100	C.
January			112	.267	.31	6,890	C.
February			112	.267	.28	6,220	C.
March	450	112	228	.544	.63	14,000	A.
April	950	335	533	1.27	1.42	31,700	A.
May	1,640	850	1,070	2.55	2.94	65,800	A.
June	3,060	950	1,860	4.44	4.95	111,000	A.
July	950	285	586	1.40	1.61	36,000	A.
August	285	150	207	.494	.57	12,700	A.
September	245	150	193	.461	.51	11,500	A.
The period						326,000	

WENATCHEE RIVER NEAR LEAVENWORTH, WASH.

Location.—In sec. 12, T. 26 N., R. 17 E., half a mile below Beaver Creek, and about 14 miles north of Leavenworth.

Records available.—November 27, 1910, to September 30, 1911.

Drainage area.—591 square miles.

Gage.—Vertical staff on left bank.

Channel.—Gravel and small bowlders; shifting in floods.

Discharge measurements.—Made from cable three-eighths of a mile above the gage.

Winter flow.—Not seriously affected by ice.

Accuracy.—Results good.

Cooperation.—Gage heights furnished by Quincy Valley Water Users' Association.

Discharge measurements of Wenatchee River near Leavenworth, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Nov. 28	F. C. Ebert	4.34	2,590	May 27	G. L. Parker	5.44	3,770
				30	.....do	6.19	4,930
1911.				Aug. 7	W. W. Clifford	3.62	1,220
Mar. 10	.....do	2.61	519	Sept. 20	R. C. Pierce	3.13	784
11	.....do	2.62	504				

Daily gage height, in feet, of Wenatchee River near Leavenworth, Wash., for the year ending Sept. 30, 1911.

[R. E. Nickles, observer.]

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1		3.96	3.05	2.85	2.55	4.2	5.6	7.6	5.1	3.8	3.2
2		3.89	3.0	2.9	2.6	4.2	5.7	7.8	5.1	3.8	3.25
3		3.80	3.05	2.9	2.6	4.2	5.8	7.6	5.2	3.8	3.3
4		3.75	3.05	2.9	2.6	4.1	6.1	6.8			3.4
5		3.68	3.05	2.8	2.55	4.0	6.1	6.2	5.2	3.7	3.2
6		3.65	3.1	2.8	2.6	4.0	6.0	6.1	5.4	3.75	3.2
7		3.60	3.25	2.75	2.6		5.8	6.0	5.4	3.6	3.2
8		3.53	3.25	2.75	2.6	3.9	5.6	6.0	5.0	3.5	3.1
9		3.47		2.75	2.6	4.0	5.5	6.1	4.9	3.45	3.05
10		3.42	3.2	2.75	2.6	4.0	5.4	6.1	4.7	3.4	3.1
11		3.38	3.15	2.75	2.6	4.0	5.2	6.9	4.6	3.4	3.05
12		3.34	3.05	2.75	2.6	3.95	5.2	7.6		3.3	3.1
13		3.30	2.95	2.75	2.6	3.9	5.1	8.1	4.8	3.3	3.1
14		3.24	2.9	2.75	2.65	3.8		8.2	4.9	3.3	3.2
15		3.15	2.85	2.7	2.7	3.8	5.0	7.9	5.0	3.25	3.5
16		3.09	2.95	2.7	2.7	3.85	5.4	7.6	5.3	3.2	3.6
17		3.10	3.0	2.7	2.8	3.8	5.7	7.2	5.4	3.2	3.45
18		3.10	3.0	2.7	2.85	3.85		6.6	5.4	3.2	3.3
19			3.0	2.65	2.95	3.85	5.6	6.4	5.0	3.3	3.2
20		3.10	3.0	2.6	3.1	3.85	5.5	6.0	4.7	3.2	3.15
21		3.10	3.0	2.6	3.25	4.0	5.4	5.8	4.6		
22		3.09	3.0	2.6	3.4	4.1	5.8	5.9	4.3	3.1	3.05
23		3.12	3.0	2.6	3.6	4.4	5.6	6.0	4.2	3.15	3.05
24		3.21	3.05	2.6	3.75	4.7	5.6	5.7	4.3	3.1	3.0
25		3.18	2.9	2.6	3.8	5.6	5.6	5.4	4.3	3.1	2.95
26			2.9	2.6	3.75	5.6	5.5	5.7		3.1	2.9
27	4.50	3.15	2.9	2.6	3.7	5.5	5.5	6.0	4.2	3.1	2.9
28	4.34	3.15	2.9	2.56	3.6	5.4	5.6	5.9	4.0	3.1	2.85
29	4.20	3.11	2.95		3.65	5.3	5.8	5.4	4.0	3.1	2.85
30	4.06	3.14	2.85		3.85	5.4	6.2	5.3	4.0	3.15	2.8
31		3.12	2.85		4.0		7.0			3.2	

Daily discharge, in second-feet, of Wenatchee River near Leavenworth, Wash., for the year ending Sept. 30, 1911.

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1		1,710	750	635	515	1,880	3,960	8,560	3,120	1,410	850
2		1,610	720	660	530	1,880	4,140	9,120	3,120	1,410	890
3		1,480	750	660	530	1,880	4,320	8,560	3,280	1,410	930
4		1,420	750	660	530	1,760	4,900	6,500	3,280	1,360	1,010
5		1,320	750	610	515	1,640	4,900	5,100	3,280	1,300	850
6		1,280	780	610	530	1,640	4,700	4,900	3,610	1,360	850
7		1,220	890	590	530	1,580	3,440	4,700	3,610	1,200	850
8		1,140	890	590	530	1,520	3,960	4,700	2,970	1,100	780
9		1,070	870	590	530	1,640	3,780	4,900	2,830	1,060	750
10		1,030	850	590	530	1,640	3,610	4,900	2,550	1,010	780
11		992	815	590	530	1,640	3,280	6,750	2,410	1,010	750
12		962	750	590	530	1,580	3,280	8,560	2,550	930	780
13		930	690	590	530	1,520	3,120	10,000	2,690	930	780
14		882	660	590	550	1,410	3,040	10,300	2,830	930	850
15		815	635	570	570	1,410	2,970	9,400	2,970	890	1,100
16		774	690	570	570	1,460	3,610	8,560	3,440	850	1,200
17		780	720	570	610	1,410	4,140	7,500	3,610	850	1,060
18		780	720	570	635	1,460	4,050	6,020	3,610	850	930
19		780	720	550	690	1,460	3,960	5,540	2,970	930	850
20		780	720	530	780	1,460	3,780	4,700	2,550	850	815
21		780	720	530	890	1,640	3,610	4,320	2,410	815	782
22		774	720	530	1,010	1,760	4,320	4,510	2,010	780	750
23		794	720	530	1,200	2,140	3,960	4,700	1,880	815	750
24		858	750	530	1,360	2,550	3,960	4,140	2,010	780	720
25		836	660	530	1,410	3,960	3,960	3,610	2,010	780	690
26		826	660	530	1,360	3,960	3,780	4,140	1,940	780	660
27	3,120	815	660	530	1,300	3,780	3,780	4,700	1,880	780	660
28	2,590	815	660	518	1,200	3,610	3,960	4,510	1,640	780	635
29	2,210	787	690		1,250	3,440	4,320	3,610	1,640	780	635
30	1,910	808	635		1,460	3,610	5,100	3,440	1,640	815	610
31		794	635		1,640		7,000		1,520	850	

NOTE.—Discharge determined from a well-defined rating curve.

Monthly discharge of Wenatchee River near Leavenworth, Wash., in the year ending Sept. 30, 1911.

[Drainage area, 591 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
December	1,710	774	988	1.67	1.92	60,800	A.
January	890	635	730	1.24	1.43	44,900	A.
February	660	518	577	.976	1.02	32,000	A.
March	1,640	515	818	1.38	1.59	50,300	A.
April	3,960	1,410	2,080	3.52	3.93	124,000	A.
May	7,000	2,970	4,020	6.80	7.84	247,000	A.
June	10,300	3,440	6,030	10.2	11.38	359,000	A.
July	3,610	1,520	2,640	4.47	5.15	162,000	A.
August	1,410	780	980	1.66	1.91	60,300	A.
September	1,200	610	818	1.38	1.54	48,700	A.
The period						1,190,000	

WENATCHEE RIVER AT CASHMERE, WASH.

Location.—In the SW. ¼ sec. 32, T. 24 N., R. 19 E., at a new highway bridge on the main road from Cashmere to Leavenworth, half a mile above Mission Creek, 1 mile above Cashmere, and 9 miles above the mouth.

Records available.—July 26, 1904, to September 30, 1911.

Drainage area.—1,200 square miles.

Gage.—Chain gage on bridge since October 13, 1909; July 26, 1904, to the summer of 1907, a vertical staff at the highway bridge at Cashmere, 1 mile below the present station. From the summer of 1907 to September 28, 1908, temporary gages installed by the observer. June 20 to October 12, 1909, a vertical staff at same location as original gage.

Channel.—Rocks and gravel; practically permanent.

Discharge measurements.—Made from the bridge.

Winter flow.—Not seriously affected by ice.

Regulation.—Flow affected by operation of gates in the mill dam at Leavenworth.

Diversion.—Considerable water diverted for irrigation alone.

Accuracy.—Results good.

Discharge measurements of Wenatchee River at Cashmere, Wash., for the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Nov. 26	F. C. Ebert	4.62	8,290	Mar. 9	F. C. Ebert	0.79	825
29	.....do	2.61	3,350	Aug. 9	W. W. Clifford	1.44	1,430
				Sept. 25	R. C. Pierce	.98	886

Daily gage height, in feet, of Wenatchee River at Cashmere, Wash., in the year ending Sept. 30, 1911.

[Anson Holmes, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.65	1.9	2.45	1.4	1.1	0.6	2.7	3.6	6.1	3.2	1.8	1.1
2	1.5	1.95	2.3	1.3	1.0	.6	2.7	3.7	6.0	3.3	1.7	1.3
3	1.8	1.9	2.3	1.3	1.0	.8	2.6	3.8	5.7	3.3	1.7	1.4
4	2.6	1.75	2.2	1.4	1.0	.7	2.6	3.9	5.6	3.3	1.8	1.4
5	2.9	1.8	2.1	1.4	.9	.8	2.5	4.2	5.5	3.4	1.5	1.4
6	2.9	1.8	1.6	1.4	1.0	.8	2.3	4.1	5.3	3.5	1.6	1.3
7	3.0	2.8	2.0	1.5	1.0	.7	2.3	3.8	4.4	3.3	1.7	1.4
8	3.4	3.7	1.95	1.5	1.0	.8	2.2	3.8	4.1	3.1	1.5	1.2
9	3.05	3.0	2.0	1.6	.9	.7	2.4	3.6	4.6	2.9	1.6	1.3
10	2.95	3.0	1.8	1.4	.9	.9	2.6	3.4	4.6	2.9	1.6	1.1
11	2.85	3.45	1.75	2.0	1.0	.8	2.3	3.3	5.5	2.5	1.6	.9
12	2.6	3.25	1.75	1.3	1.0	.7	2.4	3.3	6.1	2.8	1.5	1.0
13	2.35	2.8	1.65	1.0	.9	.8	1.9	3.3	6.4	2.8	1.5	1.0
14	2.25	2.65	1.6	1.0	1.0	.7	2.2	3.1	6.5	2.9	1.4	1.0
15	2.05	2.5	1.55	1.1	.9	1.0	2.3	2.9	5.9	3.0	1.4	1.2
16	1.9	2.3	1.5	1.3	.8	1.0	2.0	3.6	5.7	3.3	1.3	1.7
17	2.15	2.3	1.5	1.4	.8	1.1	2.0	3.7	5.5	3.3	1.2	1.8
18	2.8	2.25	1.5	1.4	.8	1.3	2.3	3.8	4.7	3.3	1.2	1.4
19	2.55	2.15	1.45	1.4	.8	1.3	2.2	3.7	4.5	2.6	1.2	1.3
20	2.3	2.15	1.45	1.4	.8	1.6	2.1	3.8	4.3	2.8	1.3	1.4
21	2.25	5.8	1.4	1.2	.8	1.8	2.2	3.3	4.1	2.6	1.3	1.3
22	2.05	5.4	1.4	1.2	.8	1.9	2.4	3.8	4.4	2.3	1.1	1.4
23	1.95	4.5	1.35	1.2	.7	2.3	3.0	3.5	4.1	2.4	1.1	1.1
24	1.9	4.0	1.6	1.2	.9	2.5	3.3	3.6	3.9	2.3	1.2	1.1
25	2.9	3.5	1.55	1.2	.7	2.5	3.9	3.5	4.0	2.4	1.2	1.2
26	2.9	3.15	1.5	1.1	.8	2.3	3.7	3.5	4.0	2.4	1.2	1.1
27	2.6	3.0	1.4	1.2	.6	2.1	3.6	3.4	4.2	2.3	1.1	1.1
28	2.35	2.7	1.4	1.2	.6	2.2	3.5	3.7	4.1	2.1	1.1	1.0
29	2.25	2.6	1.4	1.1	......	2.1	3.6	3.7	3.6	1.5	1.1	1.0
30	1.95	2.5	1.45	1.0	......	2.2	3.5	4.4	3.6	2.0	1.1	.8
31	1.75	......	1.45	1.0	......	2.5	......	5.1	......	1.8	1.1	......

Daily discharge, in second-feet, of Wenatchee River at Cashmere, Wash., for the year ending Sept. 30, 1910.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1,190	1,020	17,200	1,920	1,520	1,650	4,420	11,700	11,800	5,580	2,630	1,010
2	1,110	1,140	11,500	1,520	1,460	2,360	4,420	11,700	11,500	5,970	2,540	965
3	1,030	3,900	8,600	1,280	1,280	2,760	4,420	10,900	8,600	5,710	2,300	1,010
4	960	5,200	6,530	1,280	1,520	3,790	4,640	9,680	9,140	5,840	2,220	1,010
5	960	4,000	6,240	1,220	1,520	2,520	4,210	7,920	7,280	5,710	2,300	1,010
6	1,110	3,210	5,220	1,460	1,520	2,520	4,420	9,500	6,680	6,100	2,220	965
7	1,280	2,600	4,970	1,400	1,580	2,360	4,530	9,680	8,780	5,970	2,220	965
8	1,480	2,440	4,000	1,520	1,650	2,440	4,320	10,800	7,600	6,380	2,220	965
9	1,280	2,210	3,790	1,460	1,580	2,360	2,600	16,300	7,920	6,680	2,380	965
10	1,280	1,990	3,730	1,520	1,520	2,360	2,600	18,500	8,960	6,240	2,380	920
11	1,380	1,920	3,790	1,460	1,520	2,520	2,680	18,300	11,500	5,840	2,380	830
12	1,480	1,780	3,690	1,520	1,520	2,850	3,030	17,000	11,500	6,100	2,220	670
13	1,260	1,520	4,420	1,400	1,520	2,850	2,760	14,200	10,400	6,240	2,220	750
14	1,190	1,280	3,790	1,460	1,460	3,210	2,680	13,400	8,600	5,970	1,990	670
15	1,120	1,340	3,400	1,520	1,340	3,790	3,210	12,200	8,260	5,120	1,920	750
16	1,050	1,280	3,210	1,340	1,280	4,640	3,210	10,900	8,260	5,120	1,920	670
17	990	1,340	2,940	1,400	1,520	4,640	5,080	10,600	7,130	5,340	1,580	710
18	933	2,210	2,600	1,220	1,340	5,580	5,710	10,000	6,680	4,480	1,520	790
19	870	5,080	2,440	1,220	1,280	5,840	7,920	10,600	6,380	3,800	1,390	710
20	870	5,450	2,410	1,220	1,340	7,280	9,500	10,900	6,830	3,890	1,390	920
21	897	4,000	2,140	1,280	1,460	10,400	11,500	10,600	5,840	4,080	1,520	670
22	933	3,790	1,920	1,280	1,520	7,280	10,400	15,900	5,340	3,700	1,450	920
23	897	12,800	1,720	1,520	1,460	7,600	10,000	13,400	5,230	3,610	1,390	965
24	897	16,300	2,060	2,440	1,060	7,920	12,200	16,800	5,120	3,700	1,330	1,060
25	1,090	10,600	1,990	2,680	1,220	6,380	13,600	16,100	5,340	3,160	1,160	1,010
26	1,010	9,140	1,920	2,600	1,280	6,100	18,900	15,500	6,240	3,070	1,220	965
27	990	6,240	1,920	2,360	1,280	6,100	17,000	11,500	5,840	2,980	1,060	920
28	915	7,280	1,920	2,140	1,170	5,580	11,500	11,500	5,710	2,980	965	875
29	915	15,700	1,780	1,920	......	5,320	11,700	11,800	5,580	2,890	1,010	830
30	933	20,900	1,820	1,920	......	5,320	9,860	11,800	5,580	2,800	965	790
31	951	......	1,920	1,920	......	4,860	......	11,700	......	2,720	1,010	......

Daily discharge, in second-feet, of Wenatchee River at Cashmere, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	710	2,140	3,070	1,450	1,110	670	3,520	5,340	13,800	4,410	1,870	1,020
2	1,580	2,220	2,800	1,330	1,010	670	3,520	5,580	13,400	4,620	1,730	1,230
3	1,990	2,140	2,800	1,330	1,010	830	3,340	5,840	12,200	4,620	1,730	1,350
4	3,340	1,920	2,630	1,450	1,010	750	3,340	6,100	11,800	4,620	1,870	1,350
5	3,890	1,990	2,460	1,450	920	830	3,160	6,980	11,500	4,840	1,470	1,350
6	3,890	1,990	1,710	1,450	1,010	830	2,800	6,680	10,800	5,080	1,600	1,230
7	4,080	3,700	2,300	1,580	1,010	750	2,800	5,840	7,600	4,620	1,730	1,350
8	4,900	5,580	2,220	1,580	1,010	830	2,630	5,840	6,680	4,200	1,470	1,120
9	4,180	4,080	2,300	1,710	920	750	2,980	5,340	8,260	3,800	1,600	1,230
10	3,980	4,080	1,990	1,450	920	920	3,340	4,900	8,260	3,800	1,600	1,020
11	3,800	5,010	1,920	2,300	1,010	830	2,800	4,680	11,500	3,030	1,600	840
12	3,340	4,580	1,920	1,330	1,010	750	2,980	4,680	13,800	3,600	1,470	930
13	2,890	3,700	1,780	1,010	920	830	2,140	4,680	15,100	3,600	1,470	930
14	2,720	3,430	1,710	1,010	1,010	750	2,630	4,280	15,500	3,800	1,350	930
15	2,380	3,160	1,640	1,110	920	1,010	2,800	3,890	13,000	4,000	1,350	1,120
16	2,140	2,800	1,580	1,330	830	1,010	2,300	5,340	12,200	4,620	1,230	1,730
17	2,540	2,800	1,580	1,450	830	1,110	2,300	5,580	11,500	4,620	1,120	1,870
18	3,700	2,720	1,580	1,450	830	1,330	2,800	5,840	8,600	4,620	1,120	1,350
19	3,250	2,540	1,520	1,450	830	1,330	2,630	5,580	7,920	3,220	1,120	1,230
20	2,800	2,540	1,520	1,450	830	1,710	2,460	5,840	7,280	3,600	1,230	1,350
21	2,720	12,600	1,450	1,220	830	1,990	2,630	4,680	6,680	3,220	1,230	1,230
22	2,380	11,100	1,450	1,220	830	2,140	2,980	5,840	7,600	2,660	1,020	1,350
23	2,220	7,920	1,390	1,220	750	2,800	4,080	5,120	6,680	2,840	1,020	1,020
24	2,140	6,380	1,710	1,220	920	3,160	4,680	5,340	6,100	2,660	1,120	1,020
25	3,890	5,120	1,640	1,220	750	3,160	6,100	5,120	6,380	2,840	1,120	1,120
26	3,890	4,380	1,580	1,110	830	2,800	5,580	5,120	6,380	2,840	1,120	1,020
27	3,340	4,080	1,450	1,220	670	2,460	5,340	4,900	6,980	2,660	1,020	1,020
28	2,890	3,520	1,450	1,220	670	2,630	5,120	5,580	6,680	2,330	1,020	930
29	2,720	3,340	1,450	1,110	......	2,460	5,340	5,580	5,320	1,470	1,020	930
30	2,220	3,160	1,520	1,010	......	2,630	5,120	7,600	5,320	2,170	1,020	760
31	1,920	......	1,520	1,010	......	3,160	......	10,000	......	1,870	1,020	......

NOTE.—Discharge Oct. 1, 1909, to Sept. 30, 1911, determined from several fairly well defined rating curves. Discharge interpolated Oct. 14 to 16, 1909. These figures for Oct. 1 to Dec. 31, 1910, supersede those published in Water-Supply Paper 292, p. 141.

Monthly discharge of Wenatchee River at Cashmere, Wash., for 1909–1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1909-10					
October	1,480	870	1,070	65,800	B.
November	20,900	1,020	5,260	313,000	A.
December	17,200	1,720	4,050	249,000	A.
January	2,680	1,220	1,630	100,000	A.
February	1,650	1,060	1,420	78,900	A.
March	10,400	1,650	4,550	280,000	A.
April	18,900	2,600	7,100	422,000	A.
May	18,500	7,920	12,600	775,000	A.
June	11,800	5,120	7,650	455,000	A.
July	6,680	2,720	4,770	293,000	A.
August	2,630	965	1,770	109,000	A.
September	1,060	670	875	52,100	A.
The year	18,900	670	4,410	3,190,000	
1910-11.					
October	4,900	710	2,980	183,000	A.
November	12,600	1,920	4,160	248,000	A.
December	3,070	1,390	1,860	114,000	A.
January	2,300	1,010	1,340	82,400	A.
February	1,110	670	900	50,000	A.
March	3,160	670	1,540	94,700	A.
April	6,100	2,140	3,470	206,000	A.
May	10,000	3,890	5,600	344,000	A.
June	15,500	5,320	9,490	565,000	A.
July	5,080	1,470	3,580	220,000	A.
August	1,870	1,020	1,340	82,400	A.
September	1,870	760	1,160	69,000	A.
The year	15,500	670	3,120	2,260,000	

WHITE RIVER NEAR CHIWAUKUM, WASH.

Location.—In the NE. ¼ sec. 5, T. 27 N., R. 16 E., at a highway bridge 4 miles above Wenatchee Lake and about 14 miles northwest of Chiwaukum.

Records available.—May 30 to September 30, 1911.

Drainage area.—150 square miles.

Gage.—Vertical staff attached to left abutment of highway bridge.

Channel.—Rocks and gravel; shifting in floods.

Discharge measurements.—Made from the highway bridge at the gage or by wading.

Estimates withheld for additional data.

Discharge measurements of White River near Chiwaukum, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
1911.		*Feet.*	*Sec.-ft.*
May 31	G. L. Parker	5.90	2,440
Aug. 2	W. W. Clifford	1.88	771
Sept. 12	R. C. Pierce	.70	302

Daily gage height, in feet, of White River near Chiwaukum, Wash., for the year ending Sept. 30, 1911.

Day.	May.	June.	July.	Aug.	Sept.	Day.	May.	June.	July.	Aug.	Sept.
1		7.5	3.4	1.8	1.5	16		6.9	4.9	0.90	0.95
2		7.1	3.5	2.0	1.25	17		6.2	4.6	1.15	.65
3		5.4	3.4	2.0	1.60	18		5.0	4.4	1.30	.50
4		4.4	3.4	1.8	1.15	19		4.6	3.5	1.20	.42
5		3.8	4.0	1.8	.70	20		4.2	2.9	.95	.38
6		3.9	4.0	1.6	.85	21		4.0	2.6	.80	.60
7		4.0	3.6	1.30	.60	22		5.0	2.5	.80	.35
8		4.2	3.0	1.20	.60	23		4.2	2.6	.90	.30
9		4.3	2.5	1.20	.60	24		3.6	2.8	.95	.22
10		4.8	2.7	1.20	.65	25		4.0	3.1	1.00	.18
11		7.0	2.8	1.20	.60	26		5.0	2.6	.90	.10
12		8.8	3.1	1.20	.60	27		5.2	2.2	.80	.10
13		9.0	3.6	1.15	.95	28		4.1	2.1	.80	.09
14		8.0	3.8	1.10	.70	29		3.4	2.2	1.5	.05
15		7.4	4.4	.95	1.25	30	5.2	3.4	2.1	1.40	.02
						31	5.8		1.8	1.20	

NASON CREEK NEAR NASON, WASH.

Location.—In sec. 11, T. 26 N., R. 16 E., at the mouth of Roaring Creek, about 2 miles above Nason.

Records available.—June 4 to September 30, 1911.

Drainage area.—88.7 square miles.

Gage.—Vertical staff.

Channel.—Gravel; shifting in floods.

Discharge measurements.—Made from a highway bridge one-half mile below the gage or by wading near the gage.

Accuracy.—Results fair.

Cooperation.—Gage heights furnished by United States Forest Service.

Discharge measurements of Nason Creek near Nason, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
1911.		*Feet.*	*Sec.-ft.*
June 4	G. L. Parker	3.55	774
Aug. 4	....do.	1.50	90.6
Sept. 10	R. C. Pierce	1.32	64.1

Daily gage height, in feet, and discharge, in second-feet, of Nason Creek near Nason, Wash., for the year ending Sept. 30, 1911.

[T. W. Greve, observer.]

Day.	June.		July.		August.		September.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	....	....	2.60	374	1.56	101	1.15	44
2	....	....	2.50	340	1.54	98	1.15	44
3	....	....	....	331	1.52	94	1.15	44
4	3.5	750	....	323	1.50	91	1.22	52
5	3.4	704	....	314	1.50	91	1.30	62
6	3.4	704	....	305	1.48	88	1.42	79
7	3.3	659	....	296	1.48	88	1.50	91
8	3.4	704	....	287	1.45	84	....	105
9	3.6	796	2.30	278	1.45	84	....	118
10	3.8	892	2.25	263	1.45	84	1.72	132
11	4.0	988	2.20	248	1.45	84	1.75	138
12	4.4	1,180	2.20	248	1.42	79	1.72	132
13	4.8	1,390	....	248	....	78	....	137
14	....	1,240	....	248	1.40	76	....	143
15	4.2	1,080	2.20	248	1.40	76	1.80	148
16	4.1	1,040	2.20	248	1.40	76	1.82	152
17	3.5	750	2.15	234	1.38	73	1.72	132
18	3.1	572	2.15	234	1.38	73	1.70	128
19	....	631	2.15	234	1.38	73	1.60	108
20	....	690	2.20	248	1.35	69	1.50	91
21	3.5	750	2.15	234	1.32	65	1.50	91
22	3.4	704	2.10	220	1.32	65	1.50	91
23	3.0	530	2.10	220	1.29	61	1.45	84
24	2.75	429	2.00	194	1.25	56	1.45	84
25	....	416	1.92	175	1.22	52	1.45	84
26	....	402	1.89	168	1.20	50	1.40	76
27	....	388	1.79	146	1.20	50	1.40	76
28	2.60	374	1.69	126	1.20	50	1.35	69
29	2.55	357	1.61	110	1.18	48	1.35	69
30	2.42	314	1.60	108	1.18	48	....	69
31	....	....	1.58	105	1.18	48	....	....

NOTE.—Discharge determined from a fairly well defined rating curve. Discharge interpolated for days when no gage height was reported.

Monthly discharge of Nason Creek near Nason, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
June 4-30	1,390	314	720	38,600	B.
July	374	105	237	14,600	B.
August	101	48	72.7	4,470	A.
September	152	44	95.8	5,700	A.
The period				63,400	

CHIWAWA CREEK NEAR LEAVENWORTH, WASH.

Location.—In the SW. ¼ sec. 30, T. 27 N., R. 18 E., at Jordan's ranch, one-fourth mile below Deep Creek, 2¼ miles above the mouth and about 14 miles north of Leavenworth.

Records available.—May 29 to September 30, 1911.

Drainage area.—181 square miles.

Gage.—Vertical staff in two sections.

Channel.—Rocky; practically permanent.

Discharge measurements.—Made from a cable 2¼ miles below the gage, or by wading near the gage.

Accuracy.—Results good.

Discharge measurements of Chiwawa Creek near Leavenworth, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
1911.		*Feet.*	*Sec.-ft.*
Aug. 8	W. W. Clifford	1.05	351
Sept. 19	R. C. Pierce	.71	224

Daily gage height, in feet, and discharge, in second-feet, of Chiwawa Creek near Leavenworth, Wash., for the year ending Sept. 30, 1911.

[E. Jordan, observer.]

Day.	May.		June.		July.		August.		September.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	....	....	3.0	2,320	1.90	910	1.20	422	0.80	254
2	....	....	3.0	2,320	2.00	1,010	1.20	422	.80	254
3	....	....	2.8	2,020	2.00	1,010	1.20	422	.80	254
4	....	....	2.6	1,740	1.85	865	1.20	422	1.00	330
5	....	....	2.5	1,600	2.00	1,010	1.30	474	.95	310
6	....	....	2.40	1,470	2.15	1,160	1.20	422	.85	272
7	....	....	2.40	1,470	2.10	1,110	1.20	422	.85	272
8	....	....	2.40	1,470	1.85	865	1.05	352	.85	272
9	....	....	2.45	1.540	1.75	780	1.05	352	.85	272
10	....	....	2.5	1,600	1.70	740	1.05	352	.75	238
11	....	....	2.9	2,170	1.70	740	1.05	352	.80	254
12	....	....	3.0	2,320	1.80	820	1.00	330	.85	272
13	....	....	3.2	2,630	1.60	660	.95	310	.90	290
14	....	....	3.1	2,470	1.80	820	.90	290	.80	254
15	....	....	2.9	2,170	1.95	960	.90	290	.90	290
16	....	....	....	2,020	2.10	1,110	.85	272	.85	272
17	....	....	2.7	1,880	2.00	1,010	.85	272	.75	238
18	....	....	2.5	1,600	2.00	1,010	.85	272	.70	221
19	....	....	2.30	1,340	1.70	740	.85	272	.70	221
20	....	....	2.20	1,220	1.70	740	.85	272	.70	221
21	....	....	2.15	1,160	1.70	740	.80	254	.65	206
22	....	....	2.40	1,470	1.50	590	.80	254	.65	206
23	....	....	2.20	1,220	1.40	530	.80	254	.65	206
24	....	....	2.05	1,060	1.50	590	.85	272	.60	191
25	....	....	2.25	1,280	1.45	560	.85	272	.60	191
26	....	....	2.35	1,400	1.70	740	.85	272	.55	177
27	....	....	2.45	1,540	....	682	.80	254	.55	177
28	....	....	2.25	1,280	....	624	.75	238	.55	177
29	2.05	1,060	2.00	1,010	....	566	.75	238	.50	163
30	2.30	1,340	1.95	960	....	506	.85	272	.50	163
31	2.6	1,740	....	....	1.25	448	.80	254	....	....

NOTE.—Discharge determined from a fairly well defined rating curve.

Monthly discharge of Chiwawa Creek near Leavenworth, Wash., for the year ending Sept. 30, 1911.

[Drainage area, 181 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
June	2,630	960	1,660	9.17	10.23	98,800	B.
July	1,160	448	795	4.39	5.06	48,900	A.
August	474	238	317	1.75	2.02	19,500	A.
September	330	163	237	1.31	1.46	14,100	A.
The period						181,000	

CHIWAUKUM CREEK NEAR CHIWAUKUM, WASH.

Location.—At a trail crossing, half a mile above the mouth and about a mile southeast of Chiwaukum.

Records available.—June 2 to September 30, 1911.

Drainage area.—49.6 square miles.

Gage.—Vertical staff.

Channel.—Bowlders and gravel; shifting in floods.

Discharge measurements.—Made by wading near the gage.

Estimates withheld for additional data.

Discharge measurements of Chiwaukum Creek near Chiwaukum, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
1911.		*Feet.*	*Sec.-ft.*
June 3	G. L. Parker	2.04	353
Aug. 3	Parker and Clifford	.99	62.2
Sept. 17	R. C. Pierce	.74	39.8

Daily gage height, in feet, and discharge, in second-feet, of Chiwaukum Creek near Chiwaukum, Wash., for the year ending Sept. 30, 1911.

[Pat Ryan, observer.]

Day.	June.		July.		August.		September.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	......	....	1.80	262	1.02	67	0.68	33
2	2.30	473	1.80	262	1.05	72	.68	33
3	2.10	380	1.75	245	1.00	64	.72	36
4	1.92	307	1.70	228	1.02	67	.65	30
5	1.88	292	1.65	212	1.05	72	.70	34
6	1.90	299	1.65	212	1.00	64	.75	38
7	1.92	307	1.65	212	.95	58	.72	36
8	1.95	318	1.42	145	.88	50	.70	34
9	2.05	359	1.40	140	.88	50	.78	40
10	2.60	629	1.35	128	.88	50	.72	36
11	2.80	743	1.35	128	.85	47	.70	34
12	2.90	803	1.40	140	.85	47	.72	36
13	2.60	629	1.48	162	.85	47	.72	36
14	2.50	575	1.50	167	.78	40	.72	36
15	2.35	498	1.50	167	.78	40	.72	36
16	2.20	425	1.68	222	.75	38	.85	47
17	2.05	359	1.68	222	.78	40	.78	40
18	1.95	318	1.50	167	.78	40	.72	36
19	1.88	292	1.45	154	.78	40	.70	34
20	1.80	262	1.35	128	.78	40	.70	34
21	1.78	255	1.32	122	.70	34	.72	36
22	1.98	330	1.28	113	.68	33	.70	34
23	1.82	269	1.25	107	.68	33	.70	34
24	1.80	262	1.28	113	.68	33	.70	34
25	1.82	269	1.28	113	.68	33	.70	34
26	1.82	269	1.28	113	.68	33	.65	30
27	1.82	269	1.15	88	.68	33	.65	30
28	1.80	262	1.12	83	.68	33	.60	27
29	1.80	262	1.15	88	.68	33	.60	27
30	1.80	262	1.08	76	.68	33	.60	27
31	......	....	1.02	67	.68	33	......	....

NOTE.—Discharge determined from a fairly well defined rating curve.

Monthly discharge of Chiwaukum Creek near Chiwaukum, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
June 2-30	803	255	378	21,700	B.
July	262	67	154	9,470	B.
August	72	33	45.1	2,770	B.
September	47	27	34.4	2,050	B.
The period	....	....	....	36,000	

ICICLE CREEK NEAR LEAVENWORTH, WASH.

Location.—In sec. 23, T. 24 N., R. 17 E., 1½ miles above the mouth and 2½ miles south of Leavenworth.

Records available.—June 9 to September 30, 1911.

Drainage area.—211 square miles.

Gage.—Vertical staff on left bank.

Channel.—Sand and gravel; shifting in floods.

Discharge measurements.—Made from a cable, or by wading near gage.

Diversions.—Several small diversions above the station.

Accuracy.—Results good.

Cooperation.—Gage-height record furnished by the Wenatchee Valley Gas & Electric Co.

Discharge measurements of Icicle Creek near Leavenworth, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
1911.		*Feet.*	*Sec.-ft.*
July 29	W. W. Clifford	0.84	389
Aug. 5	Parker and Clifford	.73	353
Sept. 18	R. C. Pierce	.62	276

Daily gage height, in feet, and discharge, in second-feet, of Icicle Creek near Leavenworth, Wash., for the year ending Sept. 30, 1911.

[Lyman Lamb, observer.]

Day.	June.		July.		August.		September.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1			1.75	862	0.75	345	0.39	171
2			1.80	890	.70	320	.39	171
3			1.85	918	.70	320	.39	171
4			1.80	890	.70	320	.40	176
5			1.95	972	.70	320	.40	176
6			2.20	1,110	.70	320	.43	190
7			2.10	1,060	.65	296	.55	248
8			1.65	808	.60	272	.48	214
9	3.0	1,570	1.45	698	.60	272	.50	224
10	3.8	2,050	1.35	645	.60	272	.50	224
11	5.4	3,010	1.35	645	.55	248	.45	200
12	6.4	3,660	1.35	645	.50	224	.41	181
13	6.6	3,790	1.45	698	.50	224	.50	224
14	5.7	3,200	1.55	752	.49	219	.50	224
15	4.9	2,710	1.60	780	.47	210	.70	320
16	4.4	2,410	1.80	890	.46	205	.85	395
17	3.8	2,050	1.75	862	.45	200	.70	320
18	3.2	1,690	1.50	725	.44	195	.65	296
19	2.8	1,450	1.35	645	.44	195	.55	248
20	2.6	1,330	1.30	620	.44	195	.50	224
21	2.5	1,280	1.15	545	.44	195	.50	224
22	3.1	1,630	1.05	495	.42	186	.50	224
23	2.7	1,390	1.00	470	.40	176	.50	224
24	2.2	1,110	1.00	470	.39	171	.46	205
25	2.2	1,110	1.00	470	.38	167	.42	186
26	2.6	1,330	1.00	470	.36	158	.40	176
27	2.8	1,450	.90	420	.35	153	.40	176
28	2.4	1,220	.85	395	.34	148	.37	162
29	2.0	1,000	.80	370	.32	139	.33	144
30	1.81	896	.80	370	.34	148	.32	139
31			.76	350	.38	167		

NOTE.—Discharge determined from a rating curve well defined above 100 second-feet.

Monthly discharge of Icicle Creek near Leavenworth, Wash., for the year ending Sept. 30, 1911.

[Drainage area, 211 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
June 9-30	3,790	896	1,880	8.91	7.29	82,000	A.
July	1,110	350	675	3.20	3.69	41,500	A.
August	345	139	225	1.07	1.23	13,800	A.
September	395	139	215	1.02	1.14	12,800	A.
The period						150,000	

PESHASTIN CREEK NEAR BLEWETT, WASH.

Location.—On unsurveyed land in approximately sec. 12, T. 22 N., R. 17 E., at Blewett, 1½ miles above Negro Creek, 1½ miles below Tronsen Creek, and about 13 miles above the mouth.

Records available.—June 13 to September 30, 1911.

Drainage area.—40 square miles.

Gage.—Vertical staff on left bank 20 feet below stamp mill tailrace and 200 feet above a dam which diverts water into a placer ditch. Moved upstream and set at near datum on Aug. 11, 1911.

Channel.—Shifting.

Discharge measurements.—Made by wading or from a highway bridge.

Winter flow.—Seriously affected by ice. No records obtained.

Accuracy.—Results fair. Gage heights may be affected by changes at intake of placer ditch.

Cooperation.—Gage heights furnished by J. W. McCarthy.

Discharge measurements of Peshastin Creek near Blewett, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
1911.		*Feet.*	*Sec.-ft.*
June 13	G. L. Parker	3.16	26.9
Aug. 1[a]	W. W. Clifford	.52	3.6
1[a]	do.	.52	3.8
Sept. 21[a]	R. C. Pierce	.51	2.9

[a] Reading on new gage not affected by dam.

Daily gage height, in feet, of Peshastin Creek near Blewett, Wash., for the year ending Sept. 30, 1911.

Day.	June.	July.	Aug.	Sept.	Day.	June.	July.	Aug.	Sept.
1			0.52	0.45	16	2.9		0.48	0.55
2			.58	.45	17	2.9		.45	.55
3			.58	.48	18	2.8	1.38	.45	.55
4			.60	.50	19	2.7	1.38	.45	.52
5			.58	.55	20	2.7	1.35	.41	.52
6			.54	.60	21	2.5	1.35	.45	.52
7			.52	.60	22	2.4	1.32	.45	.52
8			.52	.58	23		1.32	.45	.50
9			.52	.60	24		1.32	.45	.50
10			.52	.60	25			.42	.50
11			.52	.60	26			.42	.50
12			.48	.60	27			.42	.50
13			.48	.58	28			.42	.50
14	3.1		.48	.58	29			.42	.50
15	3.0		.48	.55	30			.42	.50
					31			.42	

CRAB CREEK AT ADRIAN, WASH.[1]

Location.—Just above the Northern Pacific Railway crossing in Adrian.

Records available.—January 27 to May 7, 1910; March 9 to April 22, 1911.

Drainage area.—Not measured.

Gage.—Two vertical staffs, 500 feet apart.

Channel.—Shifting gravel.

Discharge measurements.—Made by wading.

Accuracy.—Owing to shortness of record and flashiness of stream, results are poor.

Discharge measurements of Crab Creek at Adrian, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.		Discharge.
		Lower gage.	Upper gage.	
1911.		*Feet.*	*Feet.*	*Sec.-ft.*
Mar. 18	F. C. Ebert	0.75	1.30	257
23	....do	.00	.70	82.2
25	....do	—.10	.65	84.8
Apr. 5	....do	—.40	.40	46.4

Daily gage height, in feet, and discharge, in second-feet, of Crab Creek at Adrian, Wash., for the year ending Sept. 30, 1911.

Day.	March.		April.		Day.	March.		April.	
	Gage height.	Discharge.	Gage height.	Discharge.		Gage height.	Discharge.	Gage height.	Discharge.
1			0.4	46	16		595	—.1	12
2			.4	46	17		425	—.1	12
3			.4	46	18	1.3	255	—.1	12
4			.4	46	19	1.1	190	—.1	12
5			.35	40	20	1.0	163	—.1	12
6			.3	35	21	.9	138	—.15	11
7			.2	27	22	.9	138	—.15	11
8			.1	21	23	.7	95		
9		0	.1	21	24	.7	95		
10		275	.05	18	25	.65	86		
11		550	.0	16	26	.6	77		
12		825	—.05	14	27	.6	77		
13	2.3	1,100	—.05	14	28	.55	69		
14		930	—.1	12	29	.65	86		
15		765	—.1	12	30	.5	61		
					31	.5	61		

NOTE.—Gage height of Mar. 13 taken from lower gage. Discharge determined from a rating curve fairly well defined below 300 second-feet, applied to readings of upper gage. Discharge for Mar. 13 determined from rating curve for lower gage. Discharge Mar. 10 to 12 and Mar. 13 to 17 interpolated.

Monthly discharge of Crab Creek at Adrian, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
March 9-13	1,100	0	307	14,000
April 1-22	46	11	22.5	982
The period				15,000

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[1] Formerly known as Upper Crab Creek at Adrian, Wash.

MOSES LAKE AT MOSES LAKE, WASH.

Location.—In sec. 28, T. 19 N., R. 28 E., in the Parker Horn of Moses Lake, a mile west of Moses Lake post office.

Records available.—June 23, 1909, to September 30, 1911.

Gage.—Vertical staff.

Evaporation equipment.—Standard evaporation pan near the gage; rain gage at Moses Lake post office.

Cooperation.—Beginning in April, 1911, gage height and evaporation records furnished by the Grant Realty Co.

Daily gage height, in feet, of Moses Lake at Moses Lake, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.70			2.90			4.03	4.05	4.21	4.22	4.07	4.05
2							4.00	4.05	4.20	4.20	4.09	4.05
3			2.4		3.10			4.06	4.21	4.20	4.08	4.05
4								4.05	4.20	4.20	4.08	4.06
5		1.84					4.03	4.05	4.20	4.20	4.08	4.15
6							4.00	4.07	4.20	4.20	4.08	4.15
7				2.92			4.00	4.06	4.22	4.21	4.11	4.16
8	1.60							4.05	4.24	4.20	4.12	4.18
9								4.05	4.24	4.20	4.12	4.18
10			2.47					4.05	4.24	4.20	4.12	4.20
11								4.05	4.25	4.20	4.12	4.20
12		1.9		2.92				4.06	4.26	4.20	4.12	4.21
13					3.29		4.00	4.06	4.25	4.18	4.12	4.22
14				2.92				4.05	4.25	4.18	4.12	4.20
15	1.61					3.60		4.05	4.26	4.18	4.12	4.21
16								4.13	4.26	4.18	4.12	4.21
17			2.52			3.70		4.16	4.24	4.16	4.12	4.21
18								4.15	4.23	4.15	4.12	4.22
19		2.05					4.02	4.14	4.21	4.15	4.13	4.22
20							4.04	4.16	4.19	4.15	4.10	4.21
21				2.90			4.01	4.16	4.18	4.14	4.08	4.20
22	1.62						4.05	4.20	4.18	4.14	4.06	4.20
23			2.70				4.06	4.20	4.22	4.14	4.04	4.20
24							4.06	4.20	4.26	4.12	4.02	4.20
25							4.10	4.20	4.25	4.11	4.05	4.20
26		2.25					4.06	4.20	4.28	4.10	4.02	4.20
27							4.05	4.20	4.24	4.09	4.02	4.20
28	1.73			2.95			4.06	4.20	4.24	4.09	4.02	4.19
29							4.05	4.21	4.22	4.09	4.03	4.20
30							4.05	4.19	4.22	4.09	4.04	4.20
31			2.90			4.00		4.19		4.08	4.04	

Observations of evaporation from water surface of Moses Lake in the year ending Sept. 30, 1911.

Month.	Rain.	Evaporation.
	Inches.	*Inches.*
April 21-30	0.00	2.13
May	.73	5.08
June	.37	6.01
July	.00	6.85
August	.28	6.53
September	1.13	4.07
The period	2.51	30.67

CRAB CREEK NEAR WARDEN, WASH.[1]

Location.—In the SW. ¼ sec. 24, T. 17 N., R. 28 E., on the McManamon ranch, below the mouth of Lind Coulee, and about 12 miles west of Warden.

Records available.—June 23, 1909, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff installed July 2, 1911. The original gage was read until March 19, 1911, when a temporary gage was installed at datum 1.97 feet higher than original datum and 0.22 foot lower than datum of present gage. All readings January 1 to September 30, 1911, reduced to present datum.

Channel.—Shifting sand.

Discharge measurements.—Made by wading.

Accuracy.—Results very poor owing to shifting conditions of channel.

Discharge measurements of Crab Creek near Warden, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Nov. 11	F. B. Storey	3.89	24.9	Mar. 21	F. C. Ebert	1.40	26.1
11	do	3.89	24.1	21	do	1.40	28.5
				July 2	do	1.01	14.0
				2	Charles Leidl	1.01	13.9

Daily gage height, in feet, of Crab Creek near Warden, Wash., for the year ending Sept. 30, 1911.

[Chas. M. Thurman, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.				1.7								
2.	4.0						1.5			1.0		
3.												1.0
4.			3.9						1.1			
5.					1.7	1.5						
6.		3.8									1.0	
7.								1.1				
8.				1.6								
9.	4.0									1.0		
10.							1.3					1.1
11.		3.9	3.9						1.1			
12.					1.6	1.5						
13.		3.9									1.0	
14.												
15.								1.1				
16.	4.0			2.4						1.0		
17.							1.2					1.0
18.			3.9						1.1			
19.						1.5						
20.		3.9		3.4							1.0	
21.						1.4		1.1				
22.				2.0	1.5							
23.	3.9						1.2			1.0		
24.												1.0
25.			3.9						1.1			
26.						1.4					.9	
27.		3.9			1.5							
28.												
29.				1.7				1.1				
30.	3.9						1.2			1.0		1.0
31.												

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[1] Formerly known as Lower Crab Creek near Warden, Wash.

Daily discharge, in second-feet, of Crab Creek near Warden, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	38	25	24	......	55	35	34	21	......	......	15	14
2	38	24	24	......	55	35	35	21	......	15	15	15
3	38	23	24	......	55	35	34	21	......	......	15	15
4	38	22	24	......	55	35	33	21	21	......	15	16
5	38	21	24	......	55	35	32	21	......	......	15	16
6	38	20	24	......	54	35	31	21	......	......	15	18
7	38	21	24	......	53	35	30	21	......	......	15	18
8	38	22	24	......	51	35	28	21	......	......	15	20
9	38	23	24	......	49	35	27	21	......	15	15	20
10	38	24	24	......	47	35	26	21	......	......	15	21
11	37	25	24	......	45	35	26	21	21	......	15	20
12	37	24	24	......	43	35	25	21	......	......	15	20
13	36	24	24	......	42	35	24	21	......	......	15	18
14	36	24	24	......	42	35	23	21	......	......	15	18
15	35	24	24	......	42	35	22	21	......	......	15	16
16	35	24	24	......	41	35	21	21	......	15	15	16
17	34	24	24	......	40	35	21	21	......	......	15	15
18	32	24	24	......	39	35	21	21	21	......	15	15
19	31	24	24	......	38	35	21	21	......	......	15	15
20	30	24	24	......	37	30	21	21	......	......	15	15
21	29	24	24	......	36	27	21	21	......	......	15	15
22	28	24	24	......	35	27	21	21	......	......	14	15
23	27	24	24	......	35	27	21	21	......	15	13	15
24	27	24	24	......	35	27	21	21	......	......	12	15
25	27	24	24	......	35	27	21	21	21	......	12	15
26	27	24	24	......	35	27	21	21	......	......	11	15
27	27	24	24	......	35	28	21	21	......	......	12	15
28	27	24	24	......	35	28	21	21	......	......	12	15
29	27	24	24	......	......	30	21	21	......	......	13	15
30	27	24	24	......	......	32	21	21	......	15	13	15
31	26	......	24	......	......	32	......	21	......	......	14	......

NOTE.—Discharge determined by shifting channel methods. Discharge for January, 1911, not estimated on account of insufficient data.

Monthly discharge of Crab Creek near Warden, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
October	38	26	33.0	2,030
November	25	20	23.5	1,400
December	24	24	24.0	1,480
January	......	......	......	......
February	55	35	43.5	2,420
March	35	27	32.5	2,000
April	35	21	24.8	1,480
May	21	21	21.0	1,290
June	21	21	21.0	1,250
July	15	15	15.0	922
August	15	11	14.2	873
September	21	15	16.4	976

ROCKY FORD CREEK NEAR EPHRATA, WASH.

Location.—In sec. 8, T. 20 N., R. 27 E., three-fourths of a mile below Drumheller's ranch, about 9 miles southeast of Ephrata.

Records available.—June 21, 1909, to September 30, 1911; fragmentary.

Drainage area.—Not measured.

Gage.—Vertical staff. Prior to July 2, 1911, gage was a vertical staff at Drumheller's ranch three-fourths of a mile above the present location.

Channel.—Hard clay; practically permanent.

Discharge measurements.—Made from a foot log near the gage.

Accuracy.—Results poor owing to unreliable gage readings.

Cooperation.—Gage readings furnished by the Grant Realty Co.

Discharge measurements of Rocky Ford Creek near Ephrata, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.		Discharge.
		Old gage.	New gage.	
		Feet.	*Feet.*	*Sec. ft.*
1910.				
Dec. 13	F. C. Ebert	[a] 5.02	....	57.0
1911.				
Mar. 19	.....do	4.32	....	37.5
19	.....do	4.32	....	38.0
July 1	Ebert and Leidl	4.63	5.67	61.6
3	F. C. Ebert	....	5.67	62.0

[a] Water backed up by a dam about half a mile below gage.

Daily gage height, in feet, and discharge, in second-feet, of Rocky Ford Creek near Ephrata, Wash., for the year ending Sept. 30, 1911.

Day.	July.		August.		September.		Day.	July.		August.		September.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.		Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	....	62	5.7	58	5.7	58	16	5.7	58	4.6	20	5.7	58
2	....	60	5.7	58	5.7	58	17	5.7	58	4.6	20	5.6	54
3	5.7	58	5.7	58	5.8	63	18	5.7	58	4.6	20	5.6	54
4	5.7	58	5.7	58	5.7	58	19	5.7	58	5.0	32	5.6	54
5	5.7	58	5.7	58	5.7	58	20	5.7	58	5.0	32	5.6	54
6	5.7	58	5.7	58	5.7	58	21	5.8	63	5.0	32	5.5	50
7	5.7	58	5.7	58	5.7	58	22	5.7	58	5.0	32	5.5	50
8	5.7	58	5.7	58	5.7	58	23	5.8	63	5.0	32	5.5	50
9	5.8	63	5.7	58	5.7	58	24	5.7	58	5.0	32	5.4	50
10	5.7	58	6.7	113	5.7	58	25	5.7	58	5.0	32	5.4	50
11	5.7	58	6.7	113	5.7	58	26	5.7	58	5.0	32	5.4	50
12	5.8	63	6.7	113	5.7	58	27	5.7	58	5.7	58	5.4	50
13	5.7	58	4.6	20	5.8	63	28	5.7	58	5.7	58	5.4	50
14	5.7	58	4.6	20	5.7	58	29	5.7	58	5.7	58	5.4	50
15	5.8	63	4.6	20	5.7	58	30	5.7	58	5.7	58	5.4	50
							31	5.8	63	5.8	63	....	....

NOTE.—Gage-height record probably not reliable. Discharge determined from a poorly defined rating curve. Discharge July 1 to 2, estimated.

Monthly discharge of Rocky Ford Creek near Ephrata, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
July	63	58	59.2	3,640
August	113	20	49.4	3,040
September	63	46	54.2	3,230
The period	......	......	......	9,910

KEECHELUS LAKE NEAR MARTIN, WASH.

Location.—Just above lake outlet, 4 miles northwest of Martin, and 12 miles northwest of Easton.

Records available.—January 12, 1906, to September 30, 1911.

Drainage area.—56 square miles.

Gage.—Vertical staff in three sections.

Regulation.—Storage in the lake is controlled by the operation of gates in the temporary dam. The volume of storage released or accumulated each month has been used in connection with the records below the dam.

Daily gage height, in feet, of Keechelus Lake near Martin, Wash., for the year ending Sept. 30, 1911.

[J. W. Tomb, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.58	3.80	9.77	8.75	11.34	11.20	11.60	10.80	12.75	11.55	7.68	1.92
2	2.90	3.70	9.65	8.71	11.32	11.21	11.60	10.85	12.72	11.58	7.32	1.86
3	3.75	3.75	9.61	8.60	11.34	11.20	11.60	10.78	12.45	11.55	6.92	1.79
4	5.10	3.80	9.46	8.76	11.35	11.20	11.58	10.95	12.22	11.55	6.59	1.72
5	5.55	3.75	9.40	8.95	11.34	11.21	11.53	11.12	12.02	11.56	6.38	1.68
6	5.65	3.95	......	9.26	11.33	11.20	11.50	11.15	11.96	11.60	5.91	1.88
7	6.05	5.00	......	9.89	11.31	11.20	11.48	10.98	11.96	11.62	5.75	2.12
8	6.05	5.45	......	10.45	11.30	11.20	11.47	11.02	11.95	11.58	5.54	2.22
9	5.80	5.95	......	11.03	11.28	11.21	11.48	11.54	11.98	11.55	5.20	2.42
10	5.45	6.42	......	11.28	11.27	11.22	11.51	11.69	12.02	11.48	5.26	2.58
11	5.03	7.41	......	11.51	11.26	11.22	11.50	11.70	12.32	11.47	5.02	2.66
12	4.75	7.64	......	11.61	11.26	11.21	11.51	11.70	12.52	11.47	4.95	2.78
13	4.45	7.54	......	11.57	11.28	11.21	11.50	11.72	12.60	11.49	4.90	3.39
14	4.25	8.04	......	11.49	11.29	11.20	11.44	11.73	12.50	11.45	4.89	3.26
15	3.95	8.55	......	11.51	11.30	11.19	11.38	11.72	12.38	11.44	4.82	3.60
16	3.75	9.00	......	11.50	11.29	11.19	11.39	11.86	12.24	11.43	4.72	4.30
17	3.80	9.35	......	11.48	11.28	11.18	11.39	12.00	12.05	11.45	4.68	4.81
18	4.05	9.60	......	11.49	11.28	11.19	11.36	12.22	12.02	11.41	4.56	5.18
19	4.10	9.80	......	11.51	11.27	11.20	11.30	12.32	11.92	11.38	4.25	5.45
20	4.00	10.50	......	11.52	11.26	11.28	11.02	12.20	11.82	11.40	4.08	5.69
21	3.90	12.65	......	11.50	11.26	11.34	10.70	12.15	11.74	11.30	3.96	5.92
22	3.75	12.55	......	11.47	11.24	11.49	10.45	12.15	11.79	11.28	3.78	6.16
23	3.65	11.55	......	11.45	11.22	11.60	10.45	12.12	11.70	11.18	3.48	6.36
24	3.65	11.35	8.26	11.42	11.20	11.65	10.50	12.04	11.62	10.94	3.34	6.54
25	4.30	11.05	8.27	11.40	11.20	11.70	10.70	12.00	11.59	10.70	3.10	6.70
26	4.50	10.88	8.43	11.38	11.21	11.64	11.00	11.98	11.62	10.42	2.85	6.86
27	4.40	10.65	8.46	11.36	11.21	11.60	10.85	11.96	11.65	9.90	2.62	6.98
28	4.30	10.38	8.64	11.35	11.22	11.50	10.60	12.01	11.60	9.20	2.38	7.12
29	4.15	10.14	8.69	11.34	......	11.50	10.55	12.10	11.60	8.75	2.22	7.26
30	4.00	9.97	8.83	11.35	......	11.48	10.60	12.28	11.60	8.40	2.06	7.37
31	3.90	......	8.81	11.34	......	11.46	......	12.55	......	8.05	2.01	......

Volume of storage on Keechelus Lake near Martin, Wash., for the year ending Sept. 30, 1911.

Gage height.	Storage.	Gage height.	Storage.	Gage height.	Storage.
Feet.	*Acre-feet.*	*Feet.*	*Acre-feet.*	*Feet.*	*Acre-feet.*
0.00	0	5.00	7,100	10.00	14,500
1.00	1,400	6.00	8,550	11.00	16,000
2.00	2,800	7.00	10,000	12.00	17,500
3.00	4,200	8.00	11,500	13.00	19,050
4.00	5,650	9.00	13,000	14.00	20,600

NOTE.—This table has been used to determine the amount of water stored in or drawn from the lake and in connection with the records on Yakima River near Martin to compute the inflow into the lake.

This table differs slightly from that published in Water-Supply Paper 252. It is the same as is now used by the United States Reclamation Service.

YAKIMA RIVER NEAR MARTIN, WASH.

Location.—800 feet below dam at outlet of Keechelus Lake, 4 miles northwest of Martin and 12 miles northwest of Easton.

Records available.—October 18, 1903, to September 30, 1911.

Drainage area.—56 square miles.

Gage.—Vertical staff.

Channel.—Gravel; shifting in floods. Logs sometimes lodge on riffle control.

Discharge measurements.—Made from cable 200 feet below gage and by wading near gage.

Winter flow.—Not seriously affected by ice.

Artificial control.—Flow regulated by storage in Keechelus Lake. Results corrected for storage.

Accuracy.—Records good.

Discharge measurements of Yakima River near Martin, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
June 18	G. L. Parker	7.96	606
Sept. 7[a]	F. B. Storey	5.62	3.1

[a] Made by wading above gage.

Daily gage height, in feet, of Yakima River near Martin, Wash., for the year ending Sept. 30, 1911.

[J. W. Tomb, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	6.52	7.24	7.36	6.65	6.64	6.46	7.25	6.82	9.0	7.30	7.40	6.34
2	7.45	7.22	7.32	6.62	6.65	6.48	7.2	6.82	9.0	7.30	7.40	6.29
3	7.76	7.22	7.32	6.60	6.64	6.48	7.2	6.82	8.50	7.30	7.40	6.54
4	7.86	7.22	7.25	......	6.65	6.49	7.15	8.1	8.20	7.30	7.40	6.51
5	7.94	7.25	7.22	......	6.66	6.46	7.1	8.15	7.95	7.30	7.40	6.50
6	7.92	6.61	......	......	6.64	6.44	7.0	8.20	7.85	7.35	6.95	6.50
7	8.09	6.92	......	......	6.62	6.42	6.99	8.10	7.80	7.40	6.95	......
8	8.08	8.09	......	......	6.60	6.41	6.97	6.00	7.85	7.30	6.95	......
9	8.00	8.07	......	6.47	6.58	6.42	7.0	7.20	7.90	7.25	6.95	......
10	7.92	8.21	......	6.59	6.56	6.42	7.1	7.50	8.00	7.10	6.95	......
11	7.84	8.34	......	6.78	6.54	6.41	7.1	7.50	8.50	7.05	6.95	......
12	7.65	8.34	......	6.93	6.54	6.41	7.05	7.50	8.8	7.00	6.74	......
13	7.52	7.11	......	6.92	6.56	6.40	6.96	7.55	8.8	7.00	6.52	......
14	7.42	......	......	6.89	6.56	6.40	6.92	7.55	8.6	6.95	6.52	......
15	7.33	......	......	6.91	6.58	6.39	6.88	7.50	8.45	6.98	6.52	......
16	7.25		......	6.92	6.58	6.38	6.89	7.75	8.40	6.97	6.52	......
17	7.27	......	......	6.90	6.57	6.39	6.88	7.95	8.20	7.00	6.52	......
18	7.37	......	......	6.89	6.54	6.39	7.2	8.15	8.00	6.94	6.74	......
19	7.38	7.45	......	6.91	6.43	6.48	6.80	8.40	7.80	6.89	6.95	......
20	7.34	7.65	......	6.92	6.42	6.64	7.5	8.20	7.70	6.88	6.95	......
21	7.30	9.95	......	6.90	6.42	6.72	7.1	8.05	7.60	6.77	6.95	......
22	7.25	9.75	......	6.86	6.41	6.74	7.15	8.00	7.65	6.70	6.95	......
23	7.21	8.28	......	6.83	6.40	7.15	7.2	8.05	7.65	7.30	6.95	......
24	7.22	8.15	7.26	6.80	6.41	7.45	7.15	7.80	7.50	7.30	6.95	......
25	7.45	7.95	7.25	6.78	6.42	7.9	7.1	7.80	7.35	7.30	6.95	......
26	7.53	7.78	7.22	6.75	6.44	7.3	7.2	7.75	7.40	7.30	6.95	......
27	7.52	7.70	7.16	6.70	6.44	7.2	8.1	7.75	7.50	8.00	6.95	......
28	7.49	7.60	7.08	6.68	6.45	7.05	7.0	7.75	7.45	7.85	6.86	......
29	7.41	7.51	6.97	6.66	......	7.2	6.80	7.95	7.35	7.55	6.79	......
30	7.32	7.42	6.94	6.66	......	6.98	6.78	8.20	7.30	7.40	6.76	......
31	7.27	......	6.97	6.64	......	6.96	......	8.6	......	7.40	6.70	......

Daily discharge, in second-feet, of Yakima River near Martin, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	100	294	342	125	123	90	299	163	1,360	318	358	71
2	379	280	326	119	125	93	280	163	1,360	318	358	64
3	516	288	326	115	123	93	280	163	975	318	358	104
4	568	288	299	3	125	94	262	705	768	318	358	98
5	612	299	288	3	127	90	245	736	618	318	358	96
6	623	117	300	3	123	86	213	768	562	338	198	96
7	699	190	300	3	119	83	210	705	535	358	198	3
8	693	699	300	3	115	82	204	32	562	318	198	3
9	645	687	300	91	111	83	213	280	590	299	198	3
10	601	774	300	113	107	83	245	400	645	245	198	3
11	557	860	300	153	103	82	245	400	975	229	198	3
12	463	860	300	193	103	82	229	400	1,200	213	144	3
13	408	248	300	190	107	80	201	421	1,200	213	100	3
14	366	0	300	181	107	80	190	421	1,050	198	100	3
15	330	0	300	187	111	78	179	400	938	207	100	3
16	299	0	300	190	111	77	181	510	900	204	100	3
17	307	0	300	184	109	78	179	618	768	213	100	3
18	346	0	300	181	103	78	280	736	645	196	144	3
19	350	379	300	187	85	93	158	900	535	181	198	3
20	334	463	300	190	83	123	400	768	484	179	198	3
21	318	2,200	300	184	83	140	245	675	442	151	198	3
22	299	2,020	300	174	82	144	262	645	463	135	198	3
23	284	820	300	166	80	262	280	675	463	318	198	3
24	288	736	303	158	82	379	262	535	400	318	198	3
25	379	618	299	153	83	590	245	535	338	318	198	3
26	413	525	288	146	86	318	280	510	358	318	198	3
27	408	484	266	135	86	280	705	510	400	645	198	3
28	396	442	239	131	88	229	213	510	379	562	174	3
29	362	404	204	127	......	280	158	618	338	421	156	3
30	326	366	196	127	......	207	153	768	318	358	149	3
31	307	......	204	123	......	201	......	1,050	......	358	135	......

NOTE.—Discharge determined from a rating curve well-defined above 50 second-feet.

Monthly discharge of Yakima River near Martin, Wash., for the year ending Sept. 30, 1911.

[Drainage area 56 square miles.]

Month.	Observed discharge (second-feet).			Run-off (total in acre-feet).			Discharge without storage (second-feet).		Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Observed.	Stored.	Without storage.	Mean.	Per square mile.		
October	699	100	419	25,800	+1,890	27,700	450	8.04	9.27	A.
November	2,200	0	511	30,400	+8,950	39,400	662	11.8	13.17	A.
December	342	196	257	15,800	−1,740	14,100	229	4.09	4.72	C.
January	193	3	130	7,990	+3,800	11,800	192	3.43	3.95	A.
February	127	80	103	5,720	− 180	5,540	99.8	1.78	1.85	A.
March	590	77	153	9,410	+ 360	9,770	159	2.84	3.27	A.
April	705	153	250	14,900	−1,290	13,600	229	4.09	4.56	A.
May	1,050	32	539	33,100	+2,950	36,000	585	10.4	11.99	A.
June	1 360	318	686	40,800	−1,450	39,400	662	11.8	13.17	A.
July	645	135	293	18,000	−5,320	12,700	207	3.70	4.27	A.
August	358	100	199	12,200	−8,760	3,440	55.9	.998	1.15	A.
September	104	3	20.0	1,190	+7,740	8,930	150	2.68	2.99	C.
The year	2,200	0	298	215,000	+6,950	222,000	307	5.48	74.36	

YAKIMA RIVER AT EASTON, WASH.

Location.—In sec. 11, T. 20 N., R. 13 E., at highway bridge at Easton, three-eighths of a mile below Cascade Lumber Co.'s dam, and 1½ miles below Kachess River.

Records available.—May 12 to November 28, 1904. February 5, 1910, to September 30, 1911.

Drainage area.—184 square miles.

Gage.—Chain gage fastened to downstream guard rail of bridge.

Channel.—Gravel; shifting in floods.

Discharge measurements.—Made from highway bridge or by wading near gage.

Winter flow.—Not affected by ice.

Artificial control.—Flow regulated by storage in Keechelus and Kachess lakes. Records corrected for storage.

Accuracy.—Records good.

Discharge measurements of Yakima River at Easton, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 6	F. B. Storey	2.49	913	Apr. 28	F. B. Storey	3.07	1,420
Nov. 24	.....do	3.86	2,500	June 18	G. L. Parker	2.70	1,100

Daily gage height, in feet, of Yakima River at Easton, Wash., for the year ending Sept. 30, 1911.

[D. W. Pless, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.10	2.16	2.70	1.97	1.71	1.36	2.4	3.0	4.0	2.0	1.90	2.2
2	1.14	2.16	2.60	1.94	1.67	1.35	2.55	3.0	3.9	2.0	2.05	2.25
3	1.90	2.20	2.56	1.92	1.64	1.35	2.5	2.95	3.7	1.98	1.92	2.1
4	2.50	2.15	2.50	1.67	1.61	1.35	2.5	2.85	3.4	1.95	1.95	2.05
5	2.42	2.07	2.46	1.67	1.62	1.35	2.4	3.0	3.0	2.05	1.90	1.95
6	2.49	2.07	2.38	1.71	1.64	1.35	2.35	3.0	2.35	2.05	2.05	2.0
7	2.42	2.10	2.35	2.05	1.60	1.36	2.3	3.1	2.7	1.95	2.0	2.5
8	2.42	2.65	2.35	2.05	1.58	1.36	2.3	3.1	2.85	1.90	2.25	2.8
9	2.73	2.87	2.30	2.0	1.67	1.36	2.3	2.8	2.9	2.0	2.2	1.67
10	2.60	3.12	2.25	1.98	1.62	1.37	2.4	2.45	2.85	2.1	2.15	2.1
11	2.54	3.37	2.20	2.1	1.55	1.38	2.35	2.35	2.75	2.8	2.15	2.05
12	2.42	3.30	2.16	2.15	1.55	1.36	2.3	2.35	3.4	2.1	2.2	2.15
13	2.30	3.22	2.11	2.05	1.53	1.36	2.25	2.65	2.95	1.85	2.1	2.1
14	2.23	2.42	2.05	2.05	1.50	1.37	2.25	2.4	3.0	1.90	1.90	2.15
15	2.25	2.03	2.02	2.0	1.49	1.40	2.2	2.4	2.7	2.0	2.2	2.2
16	2.30	2.03	1.98	2.0	1.48	1.43	2.2	2.55	2.65	2.1	1.99	2.15
17	2.30	2.02	1.95	1.98	1.44	1.50	2.15	2.75	2.55	2.05	1.80	1.95
18	2.34	1.98	1.90	2.05	1.45	1.54	2.2	2.8	2.45	2.05	2.05	2.05
19	2.36	1.65	1.88	2.15	1.43	1.61	2.15	3.5	2.4	2.0	2.0	2.0
20	2.35	2.65	1.82	2.05	1.40	1.66	2.2	3.5	2.35	2.05	2.05	1.90
21	2.34	4.15	1.81	2.0	1.45	1.76	2.15	3.6	2.1	1.90	1.93	2.1
22	2.32	4.38	1.80	1.97	1.43	1.88	2.1	3.4	2.3	1.83	1.86	2.15
23	2.30	4.48	1.85	1.90	1.34	2.0	2.25	3.0	2.05	1.83	1.90	2.2
24	2.30	3.72	1.90	1.80	1.35	2.2	2.3	2.75	2.05	1.90	1.99	1.99
25	2.30	3.45	1.94	1.78	1.33	2.5	2.35	2.7	2.25	1.95	1.95	2.0
26	2.29	3.23	1.98	1.78	1.31	2.4	2.65	2.75	2.15	1.93	1.84	1.90
27	2.31	3.15	2.00	1.76	1.30	2.35	2.7	2.75	2.1	2.15	1.92	1.95
28	2.20	2.00	2.02	1.75	1.36	2.3	3.0	2.8	2.05	2.2	1.67	1.80
29	2.20	2.84	1.99	1.73	......	2.3	2.45	2.85	2.05	2.05	1.55	1.00
30	2.15	2.80	1.99	1.70	......	2.3	2.85	3.2	2.0	1.90	1.49	.95
31	2.15	......	1.99	1.70	......	2.3	......	3.5	......	1.99	1.40	......

Daily discharge, in second-feet, of Yakima River at Easton, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	114	662	1,120	532	370	206	841	1,420	2,580	551	486	690
2	124	662	1,020	512	348	202	968	1,420	2,460	551	586	728
3	486	690	977	499	332	202	920	1,370	2,210	538	499	620
4	920	655	920	348	315	202	920	1,260	1,860	518	518	586
5	857	599	890	348	321	202	841	1,420	1,420	586	486	518
6	912	599	826	370	332	202	803	1,420	803	586	586	551
7	857	620	803	586	310	206	765	1,530	1,120	518	551	920
8	857	1,060	803	586	300	206	765.	1,530	1,260	486	728	1,220
9	1,140	1,280	765	551	348	206	765	1,220	1,320	551	690	348
10	1,020	1,550	728	538	321	209	841	880	1,260	620	655	620
11	958	1,830	690	620	286	213	803	803	1,160	1,220	655	586
12	857	1,750	662	655	286	206	765	803	1,860	620	690	655
13	765	1,660	627	586	276	206	728	1,060	1,370	455	620	620
14	712	857	586	586	262	209	728	841	1,420	486	486	655
15	728	572	565	551	258	220	690	841	1,120	551	690	690
16	765	572	538	551	254	233	690	968	1,060	620	544	655
17	765	565	518	538	237	262	655	1,160	968	586	424	518
18	795	538	486	586	241	281	690	1,220	880	586	586	586
19	811	336	474	655	233	315	655	1,970	841	551	551	551
20	803	1,070	436	586	220	342	690	1,970	803	586	586	486
21	795	2,780	430	551	241	400	655	2,090	620	486	506	620
22	780	3,080	424	532	233	474	620	1,860	765	443	461	655
23	765	3,220	455	486	198	551	728	1,420	586	443	486	690
24	765	2,230	486	424	202	690	765	1,160	586	486	544	544
25	765	1,920	512	412	195	920	803	1,120	728	518	518	551
26	758	1,670	538	412	188	841	1,060	1,160	655	506	449	486
27	773	1,580	551	400	184	803	1,120	1,160	620	655	499	518
28	690	1,420	565	394	206	765	1,420	1,220	586	690	348	424
29	690	1,260	544	382	......	765	880	1,260	586	586	286	108
30	655	1,220	544	364	......	765	1,260	1,640	551	486	258	99
31	655	......	544	364	......	765	......	1,970	......	544	220	......

NOTE.—Discharge determined from a rating curve well defined between 250 and 3,600 second-feet.

Monthly discharge of Yakima River at Easton, Wash., for the year ending Sept. 30, 1911.

[Drainage area, 184 square miles.]

Month.	Observed discharge (second-feet).			Run-off (total in acre-feet).			Discharge without storage (second-feet).		Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Observed.	Stored.	Without storage.	Mean.	Per square mile.		
October	1,150	114	753	46,300	+ 6,440	52,700	857	4.66	5.37	A.
November	3,220	336	1,280	76,200	+13,200	89,400	1,500	8.16	9.10	A.
December	1,120	424	646	39,700	− 7,440	32,300	525	2.85	3.29	A.
January	655	348	500	30,700	+ 2,820	33,500	545	2.96	3.41	A.
February	370	184	268	14,900	− 1,650	13,200	238	1.29	1.34	A.
March	920	202	396	24,300	+ 3,510	27,800	452	2.46	2.84	A.
April	1,420	620	828	49,300	+ 1,330	50,600	850	4.62	5.16	A.
May	2,090	803	1,330	81,800	+ 6,590	88,400	1,440	7.83	9.03	A.
June	2,580	551	1,140	67,800	+ 6,050	73,800	1,240	6.74	7.52	A.
July	1,220	443	568	34,900	− 9,460	25,400	413	2.24	2.58	A.
August	728	220	522	32,100	−19,800	12,300	200	1.09	1.26	A.
September	1,220	99	583	34,700	−13,500	21,200	356	1.93	2.15	A.
The year	3,220	99	735	533,000	−11,900	521,000	721	3.92	53.05	

YAKIMA RIVER AT CLEALUM, WASH.

Location.—In sec. 27, T. 20 N., R. 15 E., at highway bridge at Clealum, just above Roslyn Creek, 3 miles below Clealum River and 5 miles above Teanaway River.

Records available.—August 25, 1906, to September 30, 1911.

Gage.—Since July 12, 1911, a Friez automatic gage referenced to an inclined staff on the right bank 30 feet below the bridge. Prior to August 12, 1910, a chain gage on the bridge.

Drainage area.—500 square miles.

Channel.—Rock and gravel; shifting in extreme floods.

Discharge measurements.—Made from highway bridge.

Artificial control.—Flow affected by storage in Keechelus, Kachess, and Clealum lakes. Results corrected for storage.

Winter flow.—Not seriously affected by ice.

Accuracy.—Records good.

Discharge measurements of Yakima River at Clealum, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
1910.				June 22	G. L. Parker	4.06	2,450
Oct. 6	F. B. Storey	3.56	1,860	July 13	Howard Kimble	3.15	1,390
Nov. 23	do	6.81	8,590	Sept. 30	R. K. Ray	1.11	195
1911.							
Apr. 27	do	4.88	3,540				

Daily gage height, in feet, of Yakima River at Clealum, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.52	3.2	3.95	2.9	2.20	1.84	3.95	4.5	6.2	3.65	3.05	2.32
2	1.72	3.15	3.9	2.8	2.22	1.73	4.05	4.65	6.4	3.6	3.1	2.36
3	2.30	3.1	3.8	2.8	2.18	1.75	4.1	4.9	6.1	3.5	3.25	2.22
4	3.15	3.1	3.75	2.48	2.10	1.80	4.0	5.0	5.6	3.5	3.25	2.42
5	3.4	3.05	3.7	2.48	2.10	1.82	3.8	5.2	5.1	3.5	3.3	2.47
6	3.55	3.2	3.65	2.5	2.10	1.84	3.7	5.15	4.85	3.5	2.95	2.44
7	3.65	3.38	3.6	2.9	2.10	1.88	3.6	4.75	4.8	3.45	2.6	2.32
8	3.85	3.7	3.55	2.95	2.08	1.92	3.5	4.85	4.8	3.4	2.8	2.32
9	3.95	4.05	3.5	2.9	2.00	1.95	3.6	4.4	4.8	3.4	2.6	2.32
10	3.95	4.15	3.5	2.8	2.00	2.00	3.7	4.3	4.8	3.3	2.55	2.31
11	3.4	4.5	3.4	2.7	1.98	2.00	3.7	4.2	5.25	3.2	2.5	2.29
12	3.5	4.5	3.38	2.7	2.00	2.00	3.6	4.2	5.7	3.2	2.5	2.27
13	3.3	4.5	3.3	2.7	2.00	1.98	3.5	4.2	6.0	3.2	2.41	2.28
14	3.15	4.0	3.2	2.6	2.00	2.02	3.4	4.1	5.75	3.1	2.32	2.30
15	3.2	3.8	3.18	2.55	1.95	2.10	3.3	4.1	4.9	3.1	2.5	2.32
16	3.6	3.7	3.05	2.5	1.95	2.18	3.3	4.35	5.2	3.2	2.33	2.36
17	3.65	3.65	2.98	2.5	1.95	2.28	3.3	4.6	4.95	3.25	2.46	2.44
18	3.5	3.55	2.82	2.55	1.98	2.38	3.3	4.85	4.6	3.25	2.5	2.40
19	3.75	3.5	2.8	2.55	1.96	2.32	3.4	5.2	4.8	3.2	2.7	2.37
20	3.65	3.9	2.72	2.6	1.92	2.49	3.5	4.8	4.2	3.1	2.75	2.36
21	3.6	5.05	2.75	2.55	1.95	2.6	3.6	4.9	4.05	3.0	2.7	2.35
22	3.6	7.3	2.72	2.5	1.90	2.7	3.7	4.9	4.0	2.95	2.7	2.33
23	3.3	6.65	2.75	2.45	1.88	3.2	3.9	4.9	4.0	2.74	2.7	2.30
24	3.2	5.85	2.95	2.40	1.90	3.75	4.3	4.8	3.9	2.8	2.65	2.29
25	3.25	5.25	3.0	2.38	1.90	4.0	4.7	4.7	3.85	3.1	2.65	1.92
26	3.4	4.85	3.0	2.30	1.90	3.9	4.35	4.6	3.8	3.15	2.6	1.45
27	3.45	4.55	3.0	2.28	1.87	3.7	4.9	4.5	3.9	3.45	2.6	1.22
28	3.4	4.35	3.0	2.22	1.82	3.6	4.75	4.6	3.9	3.5	2.6	1.16
29	3.35	4.15	2.95	2.20	....	3.5	4.5	4.7	3.7	3.3	2.5	1.14
30	3.3	4.05	2.92	2.20	....	3.5	4.6	5.0	3.7	3.35	2.44	1.11
31	3.25	....	2.9	2.20	....	3.7	....	5.5	....	3.2	2.37	....

Daily discharge, in second-feet, of Yakima River at Clealum, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	297	1,490	2,390	1,170	680	480	2,350	3,200	6,840	1,960	1,310	752
2	372	1,440	2,320	1,080	692	428	2,490	3,460	7,380	1,900	1,360	776
3	714	1,390	2,190	1,080	668	438	2,560	3,920	6,580	1,780	1,510	692
4	1,440	1,390	2,120	852	620	460	2,420	4,110	5,340	1,780	1,510	813
5	1,700	1,340	2,060	852	620	470	2,150	4,500	4,300	1,780	1,560	846
6	1,870	1,490	2,000	865	620	480	2,020	4,400	3,820	1,780	1,220	826
7	2,000	1,680	1,930	1,170	620	500	1,900	3,640	3,730	1,720	930	752
8	2,260	2,060	1,870	1,220	609	521	1,780	3,820	3,730	1,670	1,080	752
9	2,390	2,530	1,810	1,170	565	538	1,900	3,030	3,730	1,670	930	752
10	2,390	2,680	1,810	1,080	565	565	2,020	2,870	3,730	1,560	898	746
11	1,700	3,220	1,700	1,000	554	565	2,020	2,710	4,600	1,460	865	734
12	1,810	3,220	1,680	1,000	565	565	1,900	2,710	5,570	1,460	865	722
13	1,600	3,220	1,600	1,000	565	554	1,780	2,710	6,320	1,460	806	728
14	1,440	2,460	1,490	930	565	576	1,670	2,560	5,690	1,360	752	740
15	1,490	2,190	1,470	898	538	620	1,560	2,560	3,920	1,360	865	752
16	1,930	2,060	1,340	865	538	668	1,560	2,950	4,500	1,460	758	776
17	2,000	2,000	1,270	865	538	728	1,560	3,370	4,020	1,510	839	826
18	1,810	1,870	1,120	898	554	788	1,560	3,820	3,370	1,510	865	800
19	2,120	1,810	1,100	898	543	752	1,670	4,500	3,730	1,460	1,000	782
20	2,000	2,320	1,040	930	521	858	1,780	3,730	2,710	1,360	1,040	776
21	1,930	4,200	1,060	898	538	930	1,900	3,920	2,490	1,260	1,000	770
22	1,930	10,000	1,040	865	510	1,000	2,020	3,920	2,420	1,220	1,000	758
23	1,600	8,080	1,060	832	500	1,460	2,280	3,920	2,420	1,030	1,000	740
24	1,490	5,940	1,240	800	510	2,080	2,870	3,730	2,280	1,080	965	734
25	1,540	4,600	1,290	788	510	2,420	3,550	3,550	2,220	1,360	965	521
26	1,700	3,830	1,290	740	510	2,280	2,950	3,370	2,150	1,410	930	310
27	1,760	3,300	1,290	728	495	2,020	3,920	3,200	2,280	1,720	930	229
28	1,700	2,980	1,290	692	470	1,900	3,640	3,370	2,280	1,780	930	211
29	1,650	2,680	1,240	680	....	1,780	3,200	3,550	2,020	1,560	865	205
30	1,600	2,530	1,210	680	....	1,780	3,370	4,110	2,020	1,620	826	196
31	1,540	....	1,200	680	....	2,020	....	5,120	....	1,460	782	....

NOTE.—Discharge determined from a well-defined rating curve.

Monthly discharge of Yakima River at Clealum, Wash., for the year ending Sept. 30, 1911.

[Drainage area 500 square miles.]

Month.	Observed discharge (second-feet).			Run-off (total in acre-feet).			Discharge without storage (second-feet).		Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Observed.	Stored.	Without storage.	Mean.	Per square mile.		
October	2,390	297	1,670	103,000	+20,700	124,000	2,020	4.04	4.66	A.
November	10,000	1,340	3,000	179,000	+18,300	197,000	3,310	6.62	7.39	A.
December	2,390	1,040	1,530	94,100	−23,400	70,700	1,150	2.30	2.65	A.
January	1,220	680	910	56,000	+12,900	68,900	1,120	2.24	2.58	A.
February	692	470	564	31,300	+ 1,230	32,500	585	1.17	1.22	A.
March	2,420	428	1,010	62,100	+10,600	72,700	1,180	2.36	2.72	A.
April	3,920	1,560	2,280	136,000	+ 2,770	139,000	2,340	4.68	5.22	A.
May	5,120	2,560	3,560	219,000	+ 8,270	227,000	3,690	7.38	8.51	A.
June	7,380	2,020	3,870	230,000	+ 3,290	233,000	3,920	7.84	8.75	A.
July	1,960	1,030	1,530	94,100	−17,800	76,300	1,240	2.48	2.86	A.
August	1,560	752	1,010	62,100	−33,200	28,900	470	.940	1.08	A.
September	846	196	667	39,700	+ 1,240	40,900	687	1.37	1.53	A.
The year	10,000	196	1,800	1,310,000	+ 4,900	1,310,000	1,810	3.62	49.17	

YAKIMA RIVER AT UMTANUM, WASH.

Location.—In sec. 20, T. 16 N., R. 19 E., at Umtanum, half a mile above Umtanum Creek and 13 miles south of Ellensburg.

Records available.—August 25, 1906, to May 20, 1907; August 10, 1907, to September 30, 1911.

Drainage area.—1,540 square miles.

Gage.—Barrett & Lawrence automatic gage referenced to chain gage on right bank. January 1 to September 30, 1911, datum was 0.13 foot lower than previously used.

Channel.—Rocks and gravel; shifting.

Discharge measurements.—Made from cable near gage.

Winter flow.—Not seriously affected by ice.

Regulation.—Flow affected by storage in Keechelus, Kachess, and Clealum lakes.

Diversions.—Station is below all return waters from irrigation in Kittitas Valley.

Accuracy.—Records good.

Discharge measurements of Yakima River at Umtanum, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 10	F. B. Storey	5.68	3,630	June 24	Howard Kimble	5.01	2,540
11	do	5.61	3,480	Aug. 5	F. B. Storey	3.92	1,070
June 10	Howard Kimble	6.30	3,890	Sept. 28	R. K. Ray	3.23	406

Daily gage height, in feet, of Yakima River at Umtanum, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	3.10	4.36	5.08	4.35	3.88	3.63	5.50	6.00	6.60	4.64	3.87	3.56
2	3.10	4.33	5.02	4.35	3.85	3.62	5.60	6.00	6.90	4.61	3.86	3.52
3	3.20	4.30	5.02	4.35	3.83	3.63	5.55	5.85	6.90	4.60	3.91	3.50
4	3.78	4.34	5.00	4.33	3.83	3.62	5.50	5.75	6.50	4.59	3.93	3.70
5	4.28	4.35	4.97	4.33	3.81	3.63	5.40	5.65	6.10	4.51	3.94	3.65
6	4.51	4.42	4.89	4.33	3.79	3.64	5.15	5.70	5.65	4.46	3.95	3.82
7	4.62	4.46	4.85	4.33	3.68	3.68	5.05	5.75	....	4.43	3.85	3.91
8	4.71	4.65	4.82	4.33	3.77	3.75	5.00	5.70	....	4.40	3.72	3.85
9	4.81	4.83	4.76	4.33	3.76	3.76	4.99	5.65	....	4.40	3.70	3.84
10	4.86	5.11	4.70	4.35	3.75	3.76	4.92	5.70	6.00	4.38	3.65	3.81
11	4.86	5.37	4.67	4.35	3.75	3.78	4.83	5.65	6.15	4.28	3.61	3.78
12	4.78	5.46	4.62	4.32	3.75	3.78	4.68	5.55	6.30	4.18	3.59	3.79
13	4.68	5.52	4.58	4.29	3.75	3.88	4.52	5.35	6.55	4.08	3.57	3.80
14	4.49	5.52	4.54	4.27	3.74	3.94	4.41	5.25	6.35	4.00	3.55	3.78
15	4.16	5.48	4.48	4.25	3.73	4.04	4.50	5.19	6.10	4.00	3.52	3.80
16	4.05	5.29	4.44	4.23	3.71	4.18	4.62	5.35	5.95	4.06	3.55	3.80
17	4.06	4.92	4.40	4.21	3.71	4.32	4.66	5.50	5.80	4.12	3.50	3.82
18	4.04	4.67	4.40	4.22	3.70	4.52	4.62	5.60	5.55	4.10	3.54	3.82
19	4.02	4.58	4.38	4.23	3.69	4.64	4.72	5.80	5.40	4.10	3.62	3.82
20	4.01	4.66	4.36	4.21	3.69	4.72	4.86	5.80	5.20	4.10	3.71	3.82
21	4.02	4.88	4.32	4.20	3.68	4.94	5.00	5.75	5.05	4.10	3.76	3.80
22	4.04	6.06	4.29	4.17	3.67	5.15	5.15	5.70	4.95	4.10	3.81	3.78
23	4.17	7.44	4.26	4.02	3.66	5.30	5.30	5.70	4.95	4.11	3.75	3.76
24	4.32	6.68	4.22	4.09	3.66	5.40	5.45	5.65	5.05	4.04	3.71	3.72
25	4.29	6.15	4.23	4.05	3.65	5.50	5.60	5.80	4.98	3.92	3.69	3.69
26	4.32	5.78	4.28	4.01	3.65	5.45	5.75	5.90	4.91	4.04	3.69	3.58
27	4.47	5.44	4.30	3.97	3.64	5.35	5.90	5.95	4.82	4.04	3.71	3.32
28	4.46	5.38	4.29	3.95	3.63	5.20	6.00	6.00	4.74	4.12	3.70	3.24
29	4.40	5.22	4.26	3.93	....	5.10	6.10	6.15	4.68	4.19	3.70	3.20
30	4.41	5.14	4.23	3.92	....	5.15	6.10	6.20	4.64	4.11	3.68	3.16
31	4.39	....	4.22	3.89	....	5.30	....	6.30	....	3.99	3.58	....

Daily discharge, in second-feet, of Yakima River at Umtanum, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	365	1,680	2,930	1,350	815	577	3,250	4,400	6,270	2,000	1,010	687
2	365	1,640	2,810	1,350	785	568	3,460	4,400	7,330	1,960	996	649
3	435	1,600	2,810	1,350	765	577	3,360	4,030	7,330	1,950	1,050	630
4	969	1,660	2,770	1,320	765	568	3,250	3,800	6,010	1,950	1,070	825
5	1,650	1,670	2,710	1,320	745	577	3,050	3,570	4,810	1,830	1,080	775
6	1,910	1,770	2,560	1,320	726	586	2,570	3,680	3,700	1,760	1,100	952
7	2,080	1,830	2,490	1,320	622	622	2,390	3,800	3,930	1,720	985	1,050
8	2,240	2,140	2,440	1,320	706	688	2,300	3,680	4,160	1,670	846	985
9	2,420	2,450	2,330	1,320	697	697	2,280	3,570	4,390	1,670	825	974
10	2,510	2,990	2,220	1,350	688	697	2,160	3,680	4,620	1,640	775	941
11	2,510	3,570	2,170	1,350	688	716	2,010	3,570	5,010	1,500	735	909
12	2,360	3,780	2,080	1,310	688	716	1,790	3,360	5,510	1,370	716	920
13	2,190	3,930	2,020	1,270	688	815	1,570	2,950	6,300	1,250	696	930
14	1,880	3,930	1,950	1,250	678	877	1,420	2,760	5,700	1,150	678	909
15	1,410	3,830	1,860	1,220	668	984	1,540	2,650	4,950	1,150	649	930
16	1,280	3,390	1,800	1,200	650	1,140	1,700	2,950	4,560	1,220	678	930
17	1,290	2,620	1,740	1,180	650	1,310	1,760	3,250	4,180	1,300	630	952
18	1,270	2,170	1,740	1,190	640	1,570	1,700	3,460	3,610	1,270	668	952
19	1,240	2,020	1,710	1,200	631	1,730	1,840	3,910	3,290	1,270	745	952
20	1,230	2,150	1,680	1,180	631	1,840	2,060	3,910	2,910	1,270	836	952
21	1,240	2,540	1,630	1,160	622	2,200	2,300	3,800	2,620	1,270	888	930
22	1,270	5,360	1,590	1,130	613	2,570	2,570	3,680	2,460	1,270	941	909
23	1,420	10,200	1,540	962	604	2,860	2,860	3,680	2,460	1,280	878	888
24	1,630	7,290	1,490	1,040	604	3,050	3,150	3,570	2,660	1,200	836	846
25	1,590	5,620	1,500	995	595	3,250	3,460	3,910	2,540	1,060	815	815
26	1,630	4,600	1,570	951	595	3,150	3,800	4,150	2,430	1,200	815	706
27	1,840	3,740	1,600	908	586	2,950	4,150	4,280	2,270	1,200	836	472
28	1,830	3,590	1,590	888	577	2,660	4,400	4,430	2,150	1,300	825	413
29	1,740	3,230	1,540	866	....	2,480	4,670	4,870	2,050	1,390	825	385
30	1,760	3,060	1,500	856	....	2,570	4,670	5,010	2,000	1,280	805	359
31	1,730	....	1,490	825	....	2,860	....	5,330	....	1,140	706	....

NOTE.—Discharge Oct. 1 to Dec. 31, 1910, determined from a rating curve well defined between 400 and 12,000 second-feet. Discharge Jan. 1 to May 27, 1911, determined from a fairly well defined rating curve. Discharge May 28 to July 5, 1911, determined by shifting channel method. Discharge July 6 to Sept. 30, 1911, determined from a well-defined rating curve.

Monthly discharge of Yakima River at Umtanum, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	2,510	365	1,590	97,800	B.
November	10,200	1,600	3,340	199,000	A.
December	2,930	1,490	2,000	123,000	A.
January	1,350	825	1,170	71,900	B.
February	815	577	669	37,200	B.
March	3,250	568	1,560	95,900	B.
April	4,670	1,420	2,720	162,000	A.
May	5,330	2,650	3,810	234,000	A.
June	7,330	2,000	4,070	242,000	B.
July	2,000	1,060	1,440	88,500	A.
August	1,100	630	837	51,500	A.
September	1,050	359	818	48,700	A.
The year	10,200	359	2,000	1,450,000	

YAKIMA RIVER NEAR NORTH YAKIMA, WASH.

Location.—In sec. 12, T. 13 N., R. 18 E., at Selah Gap, one-fourth mile above Naches River, and 1½ miles north of North Yakima.

Records available.—May 9 to October 31, 1904; July 1 to October 15, 1911.

Drainage area.—2,150 square miles (revised).

Gage.—Vertical staff on downstream side of an abandoned bridge.

Channel.—Rocks and gravel; somewhat shifting.

Discharge measurements.—Made from old bridge at gage and from a new highway bridge half a mile above the gage. Also by wading 300 feet below the gage.

Diversions.—Station below all diversions for the upper Yakima Valley and below all return waters from the Selah Valley.

Accuracy.—Records good.

Discharge measurements of Yakima River near North Yakima, Wash., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
June 21	Howard Kimble	3.92	2,740	Sept. 26	R. K. Ray	2.10	781
July 14	....do	2.62	1,280	Oct. 10	F. B. Storey	1.90	750
Aug. 24	F. B. Storey	2.08	698	20	....do	1.90	595
30	R. K. Ray	2.00	678	Nov. 2	....do	1.56	395
Sept. 19	....do	2.30	934				

Daily gage height, in feet, and discharge, in second-feet, of Yakima River near North Yakima, Wash., for July 1 to Oct. 15, 1911.

[Edward McGann, observer.]

Day.	July.		August.		September.		October.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	3.4	2,100	2.6	1,200	1.95	645	1.9	610
2	3.4	2,100	2.5	1,110	1.9	610	1.9	610
3	3.2	1,850	2.5	1,110	1.85	577	2.0	680
4	3.2	1,850	2.5	1,110	1.8	544	2.0	680
5	3.3	1,970	2.2	836	1.9	610	1.7	480
6	3.2	1,850	2.4	1,010	2.0	680	1.65	450
7	3.0	1,620	2.35	967	2.4	1,010	1.85	577
8	3.1	1,730	2.1	756	2.25	879	1.9	610
9	2.9	1,510	2.0	680	2.25	879	1.85	577
10	2.95	1,560	1.9	610	2.25	879	1.9	610
11	3.0	1,620	2.0	680	2.2	836	1.9	610
12	2.95	1,560	1.95	645	2.2	836	1.9	610
13	2.75	1,350	1.9	610	2.2	836	1.9	610
14	2.6	1,200	1.9	610	2.2	836	1.95	645
15	2.65	1,250	1.9	610	2.2	836	1.9	610
16	2.65	1,250	1.9	610	2.25	879		
17	2.6	1,200	1.85	577	2.25	879		
18	2.7	1,300	1.9	610	2.25	879		
19	2.7	1,300	1.95	645	2.25	879		
20	2.6	1,200	1.95	645	2.25	879		
21	2.55	1,150	2.0	680	2.25	879		
22	2.5	1,110	1.9	610	2.25	879		
23	2.35	967	1.9	610	2.2	836		
24	2.35	967	2.0	680	2.2	836		
25	2.35	967	2.0	680	1.95	645		
26	2.5	1,110	2.1	756	1.9	610		
27	2.5	1,110	2.1	756	1.8	544		
28	2.6	1,200	2.1	756	1.8	544		
29	2.6	1,200	2.0	680	1.7	480		
30	2.6	1,200	2.0	680	1.75	512		
31	2.55	1,150	2.0	680				

NOTE.—Discharge determined from a well-defined rating curve based on discharge measurements made between June 21 and Nov. 2, 1911.

Monthly discharge of Yakima River near North Yakima, Wash., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
July	2,100	967	1,400	86,100	A.
August	1,200	577	748	46,000	A.
September	1,010	480	755	44,900	A.
October 1-15	680	450	598	17,800	A.

YAKIMA RIVER NEAR YAKIMA, WASH.

Location.—In sec. 17, T. 12 N., R. 19 E., at Union Gap, 600 feet below Atanum Creek, 600 feet above the intake of the New Reservation canal, and about 1 mile south of Yakima.

Records available.—August 19, 1895, to September 30, 1911.

Drainage area.—3,550 square miles (revised).

Gage.—Vertical and inclined staff on right bank.

Channel.—Gravel; shifting in floods.

Discharge measurements.—Made from cable at gage.

Winter flow.—Occasionally seriously affected by ice.

Artificial control.—Flow affected to a considerable extent by storage and irrigation above the station.

Diversions.—The Union Gap irrigation canal diverts about 25 second-feet a short distance above the station.

Accuracy.—Records good.

Discharge measurements of Yakima River near Yakima, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 28	F. B. Storey	3.39	4,770	July 3	Howard Kimble	2.80	3,880
May 3	.....do	4.02	6,830	12	F. B. Storey	2.18	2,530
16	Howard Kimble	3.66	5,790	25	.....do	1.60	1,490
June 3	.....do	5.65	12,400				
22	G. L. Parker	3.38	5,240				

Daily gage height, in feet, of Yakima River near Yakima, Wash., in the year ending Sept. 30, 1911.

[J. W. Campbell, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Day.	Apr.	May.	June.	July.	Aug.	Sept.
1	3.3	3.8	5.1	3.0	......	1.45	16	2.8	3.6	4.7	2.10	1.45	1.75
2	4.2	3.8	5.5	2.8	......	1.45	17	2.8	3.6	4.5	2.20	1.40	1.80
3	4.2	3.9	5.7	2.8	1.40	1.40	18	2.8	4.2	4.3	2.10	1.40	1.75
4	3.9	4.2	5.3	2.8	......	1.40	19	2.8	4.3	4.0	2.10	1.40	1.80
5	3.7	4.3	4.8	2.7	......	1.80	20	2.8	4.4	3.7	2.30	1.45	1.85
6	3.5	4.4	4.4	2.7	1.50	1.95	21	2.8	4.3	3.5	2.25	1.55	1.85
7	3.4	4.3	4.3	2.7	1.50	1.80	22	2.8	4.2	3.4	1.85	1.60	1.80
8	3.4	4.2	4.2	2.50	1.40	1.75	23	3.0	4.3	3.4	1.80	1.55	1.95
9	3.3	4.3	4.2	2.50	1.60	1.70	24	3.3	4.3	3.4	1.68	1.55	1.90
10	3.4	3.9	4.3	2.40	1.50	1.65	25	3.6	4.3	3.2	1.68	......	1.85
11	3.4	3.8	4.5	2.30	1.60	1.80	26	3.9	4.3	3.1	1.68	1.50	1.90
12	3.3	3.7	4.9	2.30	1.55	1.75	27	4.3	4.2	3.3	1.68	......	1.70
13	3.3	3.8	5.4	2.30	1.50	1.70	28	4.2	4.1	3.3	1.68	......	1.65
14	3.0	3.7	5.4	2.10	1.45	1.65	29	4.2	4.2	3.2	1.68	1.50	1.50
15	2.8	3.7	5.2	2.10	1.45	1.60	30	4.2	4.3	3.1	1.68	1.50	1.45
							31	......	4.5	......	......	1.40	......

Daily discharge, in second-feet, of Yakima River near Yakima, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	839	2,310	5,620	2,310	1,720	1,140	4,820	6,200	10,600	4,050	1,360	1,280
2	844	2,330	5,170	2,180	1,720	1,170	7,390	6,200	12,100	3,590	1,250	1,280
3	942	2,330	4,790	2,050	1,540	1,210	7,390	6,490	12,900	3,590	1,210	1,280
4	2,240	2,360	4,560	2,180	1,500	1,310	6,490	7,390	11,300	3,590	1,510	1,280
5	2,630	2,400	4,420	2,050	1,520	1,420	5,920	7,710	9,470	3,380	1,370	1,760
6	3,100	2,370	4,420	2,180	1,570	1,470	5,360	8,050	8,050	3,380	1,340	1,990
7	3,470	2,460	4,380	2,450	1,520	1,800	5,090	7,710	7,710	3,380	1,340	1,760
8	3,850	2,860	4,420	2,600	1,570	2,050	5,090	7,390	7,390	2,980	1,210	1,680
9	3,970	4,070	4,220	2,600	1,520	1,470	4,820	7,710	7,390	2,980	1,470	1,610
10	4,050	4,560	4,200	2,750	1,520	1,580	5,090	6,490	7,710	2,790	1,340	1,540
11	3,790	8,400	4,180	2,750	1,520	1,520	5,090	6,200	8,400	2,600	1,470	1,760
12	3,220	7,030	3,900	2,650	1,360	1,520	4,820	5,920	9,470	2,600	1,400	1,680
13	3,370	6,700	3,630	2,450	1,460	1,640	4,820	6,200	11,700	2,600	1,340	1,610
14	3,100	6,380	3,130	2,230	1,440	1,580	4,050	5,920	11,700	2,240	1,280	1,540
15	2,840	5,220	3,230	2,100	1,410	1,800	3,590	5,920	11,000	2,240	1,280	1,470
16	3,000	3,000	3,160	2,100	1,340	2,180	3,590	5,640	9,110	2,240	1,280	1,680
17	2,920	4,360	3,070	1,920	1,290	2,450	3,590	5,640	8,400	2,420	1,210	1,760
18	2,970	4,240	2,920	2,180	1,290	3,090	3,590	7,390	7,710	2,240	1,210	1,680
19	2,380	3,930	2,520	2,180	1,340	3,270	3,590	7,710	6,780	2,240	1,210	1,760
20	2,710	4,000	2,500	2,050	1,340	3,810	3,590	8,050	5,920	2,600	1,280	1,840
21	2,590	7,160	2,450	1,920	1,340	4,190	3,590	7,710	5,360	2,510	1,400	1,840
22	2,130	14,500	2,390	1,940	1,340	4,440	3,590	7,390	5,090	1,840	1,470	1,760
23	1,870	15,700	2,450	1,720	1,290	4,620	4,050	7,710	5,090	1,760	1,400	1,990
24	2,380	13,200	2,570	1,820	1,290	5,490	4,820	7,710	5,090	1,580	1,400	1,910
25	2,520	9,900	2,680	1,820	1,270	6,040	5,640	7,710	4,560	1,580	1,400	1,840
26	2,700	8,230	2,600	1,720	1,170	5,900	6,490	7,710	4,300	1,580	1,340	1,910
27	2,690	7,260	2,560	1,820	1,210	5,250	7,710	7,390	4,820	1,580	1,320	1,610
28	2,710	6,100	2,560	1,820	1,120	4,890	7,390	7,080	4,820	1,580	1,300	1,540
29	2,700	4,980	2,530	1,720	....	4,780	7,390	7,390	4,560	1,580	1,340	1,340
30	2,640	5,590	2,500	1,720	....	4,640	7,390	7,710	4,300	1,580	1,340	1,280
31	2,530	....	2,460	1,720	....	5,430	....	8,400	....	1,550	1,210	....

NOTE.—Discharge Oct. 1, 1910, to Mar. 31, 1911, and July 31, Aug. 1, 2, 4, 5, 25, 27, and 28 estimated by combining the estimates for Yakima River near Wapato with those for Sunnyside, Old Reservation, and New Reservation canals. Estimates thus obtained are liable to some error during the period Nov. 1, 1910, to Mar. 31, 1911, when no records were kept of the flow in Old Reservation and New Reservation canals. Discharge Apr. 1, to Sept. 30, 1911, determined from a well-defined rating curve.

Monthly discharge of Yakima River near Yakima, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	4,050	839	2,700	166,000	A.
November	15,700	2,310	5,800	345,000	A.
December	5,620	2,390	3,430	211,000	A.
January	2,750	1,720	2,120	130,000	A.
February	1,720	1,120	1,410	78,300	A.
March	6,040	1,140	3,000	184,000	A.
April	7,710	3,590	5,190	309,000	A.
May	8,400	5,640	7,090	436,000	A.
June	12,900	4,300	7,760	462,000	A.
July	4,050	1,550	2,470	152,000	A.
August	1,510	1,210	1,330	81,800	A.
September	1,990	1,280	1,640	97,600	A.
The year	15,700	839	3,670	2,650,000	

NEW RESERVATION CANAL NEAR YAKIMA, WASH.

Location.—In sec. 20, T. 12 N., R. 19 E., just below Union Gap, 400 feet below the intake, 1 mile north of Parker, and 1 mile south of Yakima.

Records available.—1904 to 1911; irrigating season only.

Gage.—Inclined staff; prior to March, 1911, gage was located one-fourth mile below present gage.

Channel.—Gravel and small stones; practically permanent, except for weeds.

Discharge measurements.—Made from a footbridge at gage.

Accuracy.—Results fair.

Discharge measurements of New Reservation canal near Yakima, Wash., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 12	F. B. Storey	2.40	308	July 26	Howard Kimble	3.27	410
May 3	.....do	3.15	409	Aug. 10	F. B. Storey	2.18	251
12	.....do	3.20	432	19	R. K. Ray	2.10	239
June 7	Howard Kimble	3.40	435	Sept. 2	.....do	1.50	153
29	.....do	3.60	430	15	.....do	1.72	180
July 3	A. C. Libby	3.75	455	Oct. 6	W. O. Harmon	1.40	133
13	F. B. Storey	3.50	335	Nov. 5	F. B. Storey	.81	1.5

Daily gage height, in feet, of New Reservation canal near Yakima, Wash., for 1911.

[L. D. Pierce, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	1.10	3.00	3.15	3.70	2.35	1.75	1.15
2	1.20	3.10	3.15	3.70	2.00	1.75	1.40
3	1.30	3.10	3.20	3.70	2.00	1.45	1.45
4	1.30	3.15	3.40	3.70	2.80	1.45	1.45
5	1.00	3.35	3.40	3.70	2.80	1.97	1.45
6	1.45	2.70	3.40	3.70	2.80	2.70	1.40
7	2.20	2.60	3.40	3.70	2.85	2.92	1.40
8	2.25	2.90	3.40	3.60	2.60	2.75	1.40
9	2.25	3.00	3.30	3.60	2.50	2.50	1.40
10	2.40	3.10	3.30	3.60	2.20	2.20	1.40
11	2.40	3.10	3.35	3.60	1.00	1.88	1.45
12	2.40	3.20	3.35	3.50	1.10	1.68	1.45
13	2.50	3.00	3.00	3.50	1.65	1.68	1.45
14	2.50	3.00	2.90	3.50	1.60	1.70	1.45
15	2.50	2.90	2.90	3.50	2.40	1.70	1.45
16	2.50	2.90	2.90	3.50	2.10	1.70	1.58
17	2.55	2.90	2.60	3.60	2.10	1.75	1.75
18	2.58	2.95	2.75	3.60	2.10	1.52	1.85
19	2.60	2.90	2.80	3.60	2.10	1.42	1.90
20	2.70	2.80	3.00	3.70	2.10	1.50	1.90
21	2.78	2.95	3.15	Dry.	2.20	1.25	1.90
22	2.80	2.85	3.25	2.95	2.20	.45	1.95
23	2.90	2.95	3.30	2.75	2.20	1.05	1.95
24	2.95	2.95	3.35	2.80	2.20	1.15	1.95
25	3.00	Dry.	3.50	3.00	2.20	1.15	1.95
26	2.90	Dry.	3.50	3.20	2.16	1.02	1.90
27	2.80	2.85	3.60	1.90	2.15	.90	1.85
28	2.80	2.95	3.60	2.80	2.12	.90	1.75
29	2.90	3.00	3.60	3.10	2.10	.98	
30	2.85	2.90	3.70	3.05	2.10	1.05	
31		3.00		3.05	2.10		

Daily discharge, in second-feet, of New Reservation canal near Yakima, Wash., for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	125	398	407	446	272	186	108
2	138	414	404	446	221	186	139
3	151	414	412	446	221	146	146
4	151	422	438	438	340	146	146
5	112	454	437	430	340	217	146
6	171	352	436	420	340	325	139
7	277	337	435	413	348	358	139
8	284	382	430	390	310	332	139
9	284	398	415	382	295	295	139
10	307	414	415	373	250	250	139
11	307	414	418	365	90	204	146
12	307	430	418	343	102	176	146
13	322	398	365	335	172	176	146
14	322	398	344	327	165	179	146
15	322	382	343	320	280	179	146
16	322	382	342	312	235	179	162
17	330	382	290	320	235	186	186
18	334	390	314	312	235	155	200
19	337	382	320	305	235	142	207
20	352	367	345	312	235	152	207
21	364	390	368	0	250	120	207
22	367	374	385	362	250	37	214
23	382	390	388	332	250	96	214
24	390	390	396	340	250	108	214
25	398	0	415	370	250	108	214
26	382	0	415	402	244	92	207
27	367	368	431	207	242	78	200
28	367	384	431	340	238	78	186
29	382	388	431	386	235	88	
30	374	373	446	378	235	96	
31		384		378	235		

NOTE.—Discharge Apr. 1 to May 24 determined from a fairly well defined rating curve. Discharge June 25 to July 8 determined from a poorly defined rating curve. Discharge July 22 to Oct. 28 determined from a rating curve well defined above 130 second-feet. Discharge for other periods determined by shifting channel methods.

Monthly discharge of New Reservation canal near Yakima, Wash., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April	398	112	301	17,900	B.
May	454	0	366	22,500	B.
June	446	290	394	23,400	B.
July	446	0	353	21,700	B.
August	348	90	245	15,100	A.
September	358	37	169	10,100	A.
October 1-28	214	108	169	9,390	A.
The period				120,000	

SUNNYSIDE CANAL NEAR WAPATO, WASH.

Location.—In sec. 28, T. 12 N., R. 19 E., 400 feet below the intake, 1 mile east of Parker, and 3½ miles northwest of Wapato.

Records available.—1904 to 1911; irrigation season only.

Gage.—Lietz automatic gage referred to an inclined staff gage since 1909; prior to 1909 several inclined gages set at arbitrary datum.

Channel.—Gravel; practically permanent.

Discharge measurements.—Made from a footbridge at the gage.

Accuracy.—Results good.

Cooperation.—Records furnished by United States Reclamation Service.

Discharge measurements of Sunnyside canal near Wapato, Wash., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 5	Moore and Schader	6.19	568	July 24	F. M. Schader	7.03	830
12	do	6.36	621	Aug. 2	Moore and Schader	7.06	845
21	F. M. Schader	6.45	650	12	Moore and Humphrey	7.08	862
28	do	6.78	760	28	Schader and Humphrey	6.92	785
May 6	do	6.84	792	Sept. 12	Moore and Schader	6.65	705
19	Moore and Schader	6.80	764	25	do	6.51	661
31	F. M. Schader	6.81	764	Oct. 4	do	6.50	656
June 12	do	6.84	773	20	do	6.49	643
26	do	6.82	759	30	do	6.24	574
July 11	do	6.89	774				

Daily gage height, in feet, of Sunnyside canal near Wapato, Wash., for Oct. 1, 1910, to Oct. 31, 1911.

Day.	Oct.	Nov.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	3.32	2.72			6.00	6.84	6.81	6.82	7.05	6.93	6.49
2	3.34	2.00			6.00	6.85	6.79	6.83	7.05	6.93	6.50
3	3.34	1.50			6.00	6.86	6.81	6.83	7.05	6.94	6.54
4	3.34	1.50			6.00	6.86	6.80	6.83	7.09	6.92	6.51
5	3.34	1.50			6.10	6.85	6.79	6.83	7.06	6.81	6.50
6	3.33	1.50			6.20	6.85	6.79	6.83	7.08	6.75	6.50
7	3.33	1.50			6.20	6.84	6.81	6.85	7.05	6.71	6.50
8	3.32	1.50			6.20	6.82	6.81	6.89	7.02	6.71	6.50
9	3.35	1.50			6.23	6.79	6.79	6.91	7.07	6.72	6.49
10	3.35	1.50			6.27	6.74	6.82	6.91	7.04	6.70	6.49
11	3.33	1.50			6.28	6.74	6.82	6.90	7.08	6.67	6.49
12	3.35	1.50			6.33	6.78	6.82	6.91	7.07	6.65	6.50
13	3.34	1.50			6.38	6.80	6.82	6.95	7.04	6.65	6.50
14	3.32	1.50			6.39	6.79	6.80	6.98	7.04	6.64	6.50
15	3.29	1.50			6.42	6.79	6.79	7.01	6.99	6.61	6.49
16	3.25	1.50	1.70		6.50	6.80	6.79	7.01	7.06	6.62	6.50
17	3.25		1.70		6.00	6.81	6.81	7.01	7.04	6.61	6.50
18	3.25		1.70		6.00	6.80	6.80	5.00	7.05	6.60	6.49
19	3.25		1.70		6.00	6.80	6.79	6.15	7.06	6.60	6.49
20	3.25		1.70		6.40	6.79	6.81	6.99	7.09	6.60	6.49
21	3.25	.82	1.70		6.42	6.80	6.81	7.01	7.07	6.60	6.49
22	3.25		1.70		6.53	6.80	6.83	7.02	7.08	6.61	6.44
23	3.25		1.70		6.61	6.80	6.85	7.03	6.98	6.60	6.43
24	3.28		1.70		6.66	6.80	6.83	7.02	6.95	6.52	6.50
25	3.27		1.70		6.73	6.80	6.81	6.95	6.95	6.51	6.47
26	3.25			4.90	6.76	6.79	6.82	7.00	6.94	6.51	6.41
27	3.20				6.79	6.79	6.84	7.08	6.94	6.50	6.30
28	3.20			5.30	6.78	6.80	6.82	7.08	6.94	6.49	6.31
29	3.20			5.60	6.82	6.81	6.80	7.10	6.96	6.49	6.33
30	3.19			5.80	6.85	6.80	6.82	7.04	6.95	6.49	6.22
31	3.19			5.80		6.81		7.03	6.91		6.56

Daily discharge, in second-feet, of Sunnyside canal near Wapato, Wash., for Oct. 1, 1910, to Oct. 31, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	635	459	0	0	25	50	508	789	767	759	839	794	654
2	643	282	0	0	25	50	508	794	763	763	839	794	658
3	647	178	10	0	25	50	508	798	772	759	843	798	674
4	651	178	40	0	25	50	508	798	767	759	861	789	662
5	651	178	0	0	50	0	538	794	763	759	852	754	658
6	647	178	0	0	50	0	568	794	759	754	857	742	658
7	647	178	0	0	50	0	568	789	767	763	839	720	658
8	643	178	0	0	50	0	568	781	763	781	830	720	658
9	655	178	0	0	50	0	576	767	754	785	852	729	650
10	651	178	0	0	50	0	599	750	767	785	839	720	650
11	643	178	0	0	50	0	595	750	767	781	861	707	650
12	651	178	0	50	50	0	611	767	772	781	857	707	654
13	647	178	20	0	100	0	630	776	772	794	843	707	654
14	639	178	40	50	125	0	630	772	763	811	843	703	650
15	627	178	0	50	150	0	642	767	754	825	821	691	646
16	612	178	0	50	217	0	660	772	754	825	852	695	650
17	616	157	0	0	217	0	508	776	759	825	843	691	650
18	623	137	0	0	217	0	508	767	754	246	848	686	646
19	623	117	0	0	217	0	508	763	746	553	852	686	642
20	620	97	0	0	217	0	628	759	754	811	866	686	642
21	620	76	0	0	217	0	638	763	754	821	857	686	642
22	620	10	0	25	217	60	670	763	763	825	852	695	622
23	620	10	0	25	217	50	699	763	772	829	816	695	619
24	631	10	0	25	217	50	720	763	763	825	803	662	650
25	627	10	80	25	217	100	746	763	759	794	803	662	646
26	616	10	80	25	50	224	759	759	759	816	798	662	630
27	597	10	80	25	50	271	767	759	767	852	798	658	598
28	597	20	80	25	50	318	759	763	763	852	798	654	601
29	597	70	80	25	......	396	781	767	754	861	807	654	607
30	589	0	80	25	......	452	794	763	759	834	803	654	574
31	589	......	80	25	......	452	......	767	......	830	785	......	679

NOTE.—Discharge determined by shifting channel methods. Discharges for Jan. 1 to Apr. 8, Apr. 16 to 20, July 18 to 19, and Oct. 27 to 31, 1911, are not official records of the United States Reclamation Service, but have been estimated and are believed to be correct.

Monthly discharge of Sunnyside canal near Wapato, Wash., for Oct. 1, 1910, to Oct. 31, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
October	655	589	628	138,600
November	459	0	132	7,860
December	80	0	21.6	1,300
January	50	0	14.5	892
February	217	25	114	6,330
March	452	0	83.0	5,100
April	794	508	623	37,100
May	798	750	771	47,400
June	772	746	762	45,300
July	861	246	776	47,700
August	861	785	834	51,300
September	798	654	707	42,100
The year	861	0	456	331,000
October	679	598	643	39,500

WASTEWAYS FROM SUNNYSIDE CANAL.

Location.—

Zillah wasteway, NW. ¼ sec. 31, T. 11 N., R. 21 E.

Snipes Mountain lateral, NE. ¼ sec. 36, T. 10 N., R. 21 E.

Sulphur Creek, SW. ¼ sec. 17, T. 10 N., R. 23 E.

Rockyford lateral, sec. 24, T. 9 N., R. 23 E.

Mabton siphon blow-off, NW. ¼ sec. 1, T. 8 N., R. 23 E.

Prosser siphon blow-off, NW. ¼ sec. 1, T. 8 N., R. 24 E.

Sunnyside canal wasteway at 60-mile station, near Prosser, Wash., in NE. ¼ sec. 20, T. 9 N., R. 25 E.

Records available.—Irrigation season of 1911.

Accuracy.—Results considered good.

Cooperation.—Records furnished by the operating department of the Sunnyside canal.

Daily discharge, in second-feet, of Zillah wasteway for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	0	11	46	31	0	0	217
2	0	0	43	48	0	0	217
3	220	8	35	65	0	0	224
4	280	12	33	65	0	0	227
5	220	11	33	41	0	0	224
6	230	12	33	14	0	0	226
7	192	15	33	10	0	89	228
8	131	15	35	4	21	89	224
9	135	30	35	0	21	135	226
10	131	30	39	0	21	140	226
11	139	25	51	0	7	140	224
12	113	24	58	0	0	135	224
13	80	14	53	0	0	140	226
14	65	7	50	0	0	168	227
15	62	7	40	0	0	187	228
16	0	7	38	0	0	192	228
17	0	12	45	0	0	201	228
18	0	15	39	0	0	200	227
19	0	27	31	0	0	201	226
20	132	35	27	0	0	202	224
21	34	48	23	0	0	205	224
22	11	37	21	0	0	206	222
23	10	32	45	0	0	208	222
24	26	37	40	0	0	255	223
25	30	48	40	0	0	280	222
26	31	48	40	0	0	261	223
27	45	51	35	0	0	237	228
28	37	45	38	0	0	227	223
29	13	43	27	0	0	217	224
30	16	46	24	0	0	217	220
31	....	45	....	0	0	....	212

NOTE.—Discharge Apr. 3 to 8, Apr. 20, and Oct. 27 to 31, estimated. The estimates are not official records of the United States Reclamation Service, but are believed to be correct.

Daily discharge, in second-feet, of Snipes Mountain lateral wasteway for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	0.0	0.0	0.84	0.0	0.0	0.0	7.14
2	.0	.0	.84	.0	.0	.0	7.14
3	.0	.0	.84	.0	.0	.0	7.14
4	.0	.0	.84	.0	.0	.0	7.14
5	.0	.0	.84	.0	.0	.0	7.14
6	.0	.0	.84	.0	.0	.0	7.14
7	.0	.0	.84	.0	.0	3.88	7.14
8	.0	.0	2.53	.0	.0	3.88	7.14
9	.0	.0	2.53	.0	.0	3.88	7.14
10	.0	.0	2.53	.0	.0	3.88	7.14
11	.0	1.4	2.53	.0	.0	3.88	7.14
12	.0	1.4	2.53	.0	.0	3.88	3.88
13	.0	1.4	2.53	.0	.0	3.88	3.88
14	.0	1.4	2.53	.0	.0	7.14	3.88
15	.0	1.4	3.52	.0	.0	7.14	3.88
16	.0	1.4	3.52	.0	.0	7.14	3.88
17	.0	1.4	3.52	.0	.0	7.14	3.88
18	.0	.84	3.52	.0	.0	7.14	3.88
19	.0	.84	3.52	.0	.0	7.14	3.88
20	.84	.84	3.52	.0	.0	7.14	3.88
21	.84	.84	3.52	.0	.0	7.14	3.88
22	.84	.84	.0	.0	.0	7.14	3.88
23	.84	.84	.0	.0	.0	7.14	3.88
24	.84	.84	.0	.0	.0	7.14	3.88
25	.84	.0	1.67	.64	.0	7.14	3.88
26	.84	.0	1.67	.64	.0	7.14	7.14
27	.0	.0	1.67	.0	.0	7.14	7.14
28	.0	.0	1.67	.0	.0	7.14	7.14
29	.0	.0	.0	.0	.0	7.14	7.14
30	.0	.0	.0	.0	.0	7.14	7.14
31	....	.0	....	.0	.0	....	7.14

Daily discharge, in second-feet, of Sulphur Creek wasteway for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	0	0	24	23	3	0	0
2	13	0	16	10	5	0	0
3	4	0	16	0	0	0	34
4	4	0	16	0	0	10	73
5	13	0	16	0	11	27	89
6	9	0	16	0	17	42	80
7	10	3	15	0	16	71	80
8	1	7	16	0	7	69	78
9	1	9	16	0	1	76	76
10	14	2	15	0	0	76	73
11	7	0	15	0	0	70	73
12	14	0	15	0	0	72	73
13	15	0	15	0	0	74	72
14	17	0	15	0	0	71	51
15	0	2	15	0	0	70	51
16	0	2	15	0	0	60	50
17	0	8	15	0	0	54	52
18	0	17	31	0	0	38	46
19	0	16	75	0	0	41	46
20	32	16	72	0	0	44	37
21	0	16	64	0	0	56	41
22	0	16	27	0	0	60	44
23	0	13	41	0	0	71	36
24	0	26	62	0	0	32	28
25	0	50	44	0	0	0	45
26	0	52	0	0	0	0	47
27	0	48	0	0	0	0	45
28	0	47	13	0	0	0	48
29	0	48	16	2	0	0	69
30	0	47	20	4	8	0	77
31	....	47	....	4	12	....	76

NOTE.—Discharges for Apr. 2 to 8, 20, and Oct. 27 to 31 are estimates. They are not official records of the United States Reclamation Service, but are believed to be correct.

Daily discharge, in second-feet, of Rockyford lateral wasteway for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	0.0	0.0	0.5	4.4	0.3	4.5	13.4
2	.0	.0	.5	4.4	.3	4.5	13.4
3	.0	.0	.5	4.4	.5	4.5	13.4
4	.0	.0	.5	4.4	.5	4.5	13.4
5	.0	.0	.5	4.4	.5	4.5	9.0
6	.0	.0	.5	.0	.5	4.5	9.0
7	.0	.0	.5	.0	.5	9.0	9.0
8	.0	.0	.0	.0	.5	9.0	9.0
9	.0	.0	.0	.0	.5	9.0	9.0
10	.0	.0	.0	.0	.8	9.0	9.0
11	.0	1.4	.0	.0	.8	9.0	9.0
12	.0	1.4	.0	.0	1.1	9.0	16.5
13	.0	1.4	.0	.0	3.2	9.0	16.5
14	.0	1.4	.0	.0	3.2	20.2	16.5
15	.0	1.4	4.6	.0	3.5	15.4	16.5
16	.0	1.4	4.6	.0	.8	13.1	16.5
17	.0	1.4	4.6	.0	2.5	13.1	16.5
18	.0	1.4	4.6	.0	1.9	13.1	16.5
19	.0	1.4	4.6	.0	1.9	14.2	14.2
20	.0	1.4	4.6	.0	2.5	15.4	14.2
21	.0	1.4	4.6	.0	2.2	17.7	14.2
22	.0	1.4	1.5	.0	1.4	17.7	14.2
23	.0	1.4	1.5	.0	1.4	17.7	14.2
24	.0	1.4	1.5	.0	3.9	17.7	14.2
25	.0	1.5	1.5	.0	3.9	17.7	14.2
26	.0	1.5	1.5	.0	3.9	17.7	15.4
27	.0	1.5	1.5	.3	3.9	17.7	15.4
28	.0	1.5	1.5	.3	3.9	13.4	15.4
29	.0	1.5	4.4	.3	3.9	13.4	15.4
30	.0	1.5	4.4	.3	3.9	13.4	15.4
31	....	1.5	....	.3	4.5	....	15.4

Daily discharge, in second-feet, of Mabton siphon blow-off for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	0.0	7.4	12.7	0.0	11.0	12.6	23.3
2	.0	8.8	13.1	.0	13.2	11.8	21.8
3	.0	5.6	13.0	.0	13.3	12.9	31.3
4	.0	.0	10.7	.0	13.5	12.6	19.8
5	37.4	.0	5.8	.0	12.4	52.6	.0
6	53.4	.0	7.0	.0	14.7	26.0	.0
7	57.5	.0	7.1	.0	13.9	22.2	.0
8	52.4	.0	6.4	.0	13.8	26.2	.0
9	48.6	.0	6.8	.0	14.0	31.7	.0
10	62.5	5.3	5.9	.0	13.0	38.4	.0
11	38.5	9.0	7.7	.0	13.5	40.9	4.1
12	33.7	8.0	5.8	.0	14.0	39.3	7.7
13	32.8	5.7	8.3	.0	13.7	33.1	4.1
14	42.3	6.9	6.5	.0	13.5	27.9	.0
15	37.7	8.6	5.8	.0	13.0	30.9	36.6
16	32.8	9.4	6.8	.0	13.6	42.5	29.8
17	.0	11.1	8.4	.0	13.7	34.0	46.3
18	.0	8.1	5.7	.0	13.3	35.1	46.2
19	13.8	10.2	6.9	.0	13.2	32.3	26.6
20	20.0	10.5	4.1	.0	14.3	33.5	18.2
21	20.1	11.2	5.0	.0	14.3	35.2	16.4
22	25.0	13.8	6.5	.0	12.4	44.4	16.2
23	20.0	13.9	7.2	.0	13.3	48.5	17.8
24	22.7	16.8	.0	.0	13.8	35.8	16.3
25	21.1	11.9	.0	.0	14.3	39.5	15.0
26	28.8	9.2	.0	.0	15.0	31.3	16.3
27	6.2	8.7	.0	.0	13.6	27.5	16.3
28	6.4	7.0	.0	.0	12.4	27.6	.0
29	7.3	7.4	.0	.0	12.4	25.4	.0
30	7.1	9.1	.0	5.8	13.4	26.7	.0
31	....	8.9	....	8.4	14.4	....	.0

NOTE.—Discharges for Apr. 5 to 8, 16, 19, 20, and Oct. 28, are estimates. They are not official records of the United States Reclamation Service, but are believed to be correct.

Daily discharge, in second-feet, of Prosser siphon blow-off for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	0.0	0.0	6.8	0.0	0.0	0.0	6.7
2	.0	.0	10.3	.0	.0	.0	8.2
3	.0	.0	6.8	.0	.0	.0	8.2
4	.0	11.8	13.5	.0	.0	.0	8.2
5	.0	14.0	14.0	.0	.0	5.5	8.7
6	.0	14.0	.0	.0	.0	5.1	12.5
7	.0	14.0	6.3	.0	.0	7.7	12.5
8	.0	14.0	5.7	.0	.0	8.0	10.3
9	.0	14.0	6.0	.0	.0	10.1	10.4
10	.0	14.0	5.2	.0	.0	11.0	10.4
11	.0	.0	6.2	.0	.0	11.0	11.3
12	.0	.0	5.7	.0	.0	10.9	10.5
13	.0	.0	7.3	.0	.0	12.9	10.8
14	.0	.0	6.3	.0	.0	11.6	10.8
15	.0	.0	.0	.0	.0	12.7	9.3
16	.0	.0	.0	.0	.0	12.6	9.3
17	.0	.0	.0	.0	.0	11.7	10.7
18	.0	8.2	.0	.0	.0	10.3	.0
19	.0	8.2	.0	.0	.0	10.8	9.1
20	.0	15.0	.0	.0	.0	11.2	9.1
21	.0	7.7	.0	.0	.0	11.7	8.9
22	.0	15.0	.0	.0	.0	11.2	8.9
23	.0	15.0	.0	.0	.0	11.2	9.3
24	.0	11.4	.0	.0	.0	11.2	8.3
25	.0	8.2	.0	.0	.0	10.6	8.7
26	.0	8.3	.0	.0	.0	9.1	9.3
27	.0	5.7	5.8	.0	.0	8.3	10.4
28	.0	8.3	.0	.0	.0	9.7	10.3
29	.0	9.8	.0	.0	.0	8.9	10.7
30	.0	7.3	.0	.0	.0	7.8	10.5
31	....	8.3	....	.0	.0	....	11.0

Daily discharge, in second-feet, of Sunnyside canal wasteway at 60-mile station, near Prosser, Wash., for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	0.0	11.3	13.9	24.5	17.1	18.9	20.2
2	60.0	12.0	15.2	24.5	18.7	20.5	21.7
3	41.2	9.5	13.9	21.0	15.6	15.8	24.7
4	31.3	17.2	15.2	20.6	17.1	15.8	15.2
5	24.0	15.2	13.9	14.5	23.0	18.9	34.4
6	37.0	15.2	15.6	20.6	18.7	20.9	26.1
7	52.0	14.8	15.6	18.8	18.7	23.1	26.1
8	29.0	19.0	14.3	12.7	15.9	18.2	26.1
9	27.9	17.9	15.6	11.5	11.6	30.7	29.3
10	32.1	13.8	14.3	12.7	9.4	21.4	27.7
11	26.6	9.1	14.3	9.3	11.6	21.4	24.6
12	24.2	7.3	14.3	8.3	14.0	19.8	24.4
13	22.4	7.3	14.3	6.3	15.5	14.9	25.9
14	19.1	13.8	14.3	10.4	14.1	23.1	27.5
15	19.1	15.8	18.5	16.9	15.8	28.7	25.9
16	18.1	19.0	18.5	14.0	13.1	24.9	24.4
17	.0	19.0	20.1	14.0	11.9	26.8	25.9
18	.0	19.0	23.4	8.3	9.7	30.7	25.9
19	.0	20.1	23.4	1.1	6.7	30.7	20.1
20	15.1	20.1	20.1	8.3	10.8	31.1	20.1
21	17.6	17.9	15.6	9.3	14.4	33.2	21.5
22	13.6	20.1	13.9	9.3	17.0	33.2	20.1
23	12.6	20.1	10.9	8.3	17.0	31.1	20.1
24	13.0	19.0	21.7	25.5	15.4	31.1	22.9
25	9.5	19.0	19.7	9.3	16.7	23.5	21.5
26	6.1	16.8	18.1	10.4	9.3	15.7	25.2
27	8.6	16.8	19.7	9.3	11.5	20.2	14.8
28	6.5	13.8	24.8	15.4	12.7	19.8	18.3
29	12.2	19.0	24.5	15.4	14.0	19.8	31.7
30	11.3	15.8	24.5	20.1	17.3	21.3	26.8
31	....	13.8	....	15.4	20.5	....	21.0

NOTE.—Discharges for Apr. 2 to 8, 16, 20, and Oct. 27 to 31, are estimates. They are not official records of the United States Reclamation Service, but are believed to be correct.

Monthly discharge of Zillah wasteway for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April	280	0	79.4	4,720
May	51	0	22.5	1,380
June	58	21	37.7	2,240
July	65	0	9.0	553
August	21	0	2.3	141
September	280	0	151	8,980
October	228	212	224	13,800
The period				31,800

Monthly discharge of Snipes Mountain lateral wasteway for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April	0.84	0.0	0.196	11.7
May	1.40	.0	.506	31.1
June	3.52	.0	1.83	109.
July	.64	.0	.041	2.5
August	.0	.0	.0	0
September	7.14	.0	4.95	295
October	7.14	3.88	5.67	349
The period				798

Monthly discharge of Sulphur Creek wasteway for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April	32	0	5.13	305
May	52	0	15.9	978
June	75	0	24.5	1,460
July	23	0	1.39	85.5
August	17	0	2.58	159
September	76	0	39.5	2,350
October	89	0	54.5	3,350
The period				8,690

Monthly discharge of Rockyford lateral wasteway for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
May	1.5	0.0	0.97	59.6
June	4.6	.0	1.83	109
July	4.4	.0	.76	46.7
August	4.5	.3	2.04	125
September	20.2	4.5	12.0	714
October	16.5	9.0	13.7	842
The period				1,900

Monthly discharge of Mabton siphon blow-off for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April	62.5	0.0	24.3	1,450
May	16.8	.0	7.50	461
June	13.1	.0	5.77	343
July	8.4	.0	.46	28.3
August	15.0	11.0	13.5	830
September	52.6	11.8	31.3	1,860
October	46.3	.0	13.9	855
The period				5,830

Monthly discharge of Prosser siphon blow-off for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
May	15.0	0.0	7.49	461
June	14.0	.0	3.53	210
July	.0	.0	.0	0
August	.0	.0	.0	0
September	12.9	.0	8.76	521
October	12.5	.0	9.46	582
The period				1,770

Monthly discharge of Sunnyside canal wasteway at 60-mile station, near Prosser, Wash., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April	60.0	0.0	19.7	1,170
May	20.1	7.3	15.8	972
June	24.8	10.9	17.4	1,040
July	25.5	1.1	13.7	842
August	23.0	6.7	14.7	904
September	33.2	14.9	23.2	1,380
October	34.4	14.8	23.9	1,470
The period				7,780

OLD RESERVATION CANAL NEAR WAPATO, WASH.

Location.—In sec. 28, T. 12 N., R. 19 E., 300 feet below the intake and above the first lateral, 1½ miles southeast of Parker and 3 miles northeast of Wapato.

Records available.—1904 to 1911; irrigation season only.

Gage.—Vertical staff.

Channel.—Mud and sand; shifting when canal is full.

Discharge measurements.—Made from a footbridge near gage.

Accuracy.—Results good.

Discharge measurements of Old Reservation canal near Wapato, Wash., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 15	F. B. Storey	0.78	54.7	July 13	F. B. Storey	2.69	180
Apr. 12	.....do	3.02	204	Aug. 10	.....do	1.49	92.9
May 3	.....do	3.47	257	14	.....do	1.55	100
17	.....do	3.78	307	19	R. K. Ray	1.53	97.5
June 7	Howard Kimble	3.58	282	Sept. 2	.....do	1.18	69.5
July 3	A. C. Libby	3.15	254	15	.....do	1.77	107

Daily gage height, in feet, of Old Reservation canal near Wapato, Wash., for 1911.

[W. A. Noblet, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	....	3.50	3.50	3.20	2.00	1.10	1.30	1.32
2	3.10	3.50	3.50	3.15	1.90	1.10	1.37	.80
3	3.10	3.50	3.50	3.15	1.85	1.10	1.32	.70
4	3.00	3.40	3.50	3.10	2.10	1.10	1.32	.70
5	2.90	3.80	3.50	3.10	2.00	1.95	1.32	.60
6	2.90	3.80	3.60	3.10	2.05	1.95	1.32	.60
7	3.00	3.80	3.60	3.10	2.00	1.95	....	....
8	2.90	3.90	3.60	3.00	1.90	1.90	....	.60
9	2.80	3.90	3.60	3.00	2.10	1.95	1.28	....
10	3.10	3.80	3.65	2.90	1.50	2.10	1.27	....
11	3.10	3.80	....	2.80	1.40	2.05	1.25	....
12	3.00	3.80	3.50	2.65	1.40	1.80	1.25	.60
13	2.80	3.75	3.40	2.60	1.90	1.80	1.25	....
14	2.90	3.70	2.80	2.75	1.60	1.80	1.27	....
15	2.90	3.80	2.80	2.75	1.65	1.80	....	....
16	2.90	3.70	2.80	2.80	1.60	1.70	1.27	....
17	3.00	3.70	2.80	2.90	1.60	....	1.27	....
18	3.10	3.65	2.80	2.90	1.60	1.75	1.25	.60
19	3.20	3.80	2.75	....	1.55	1.78	1.22	....
20	....	3.80	2.70	2.60	1.60	1.78	1.30	.60
21	3.20	3.70	2.85	2.70	1.65	1.50	1.40	....
22	3.40	3.70	2.85	2.40	1.65	1.50	....	....
23	3.60	3.70	2.90	2.30	1.65	1.50	1.40	....
24	3.70	3.00	2.90	2.10	1.65	....	1.40	....
25	3.80	3.00	2.80	2.00	1.65	1.50	1.40	.60
26	3.80	2.90	2.90	2.20	1.65	1.50	....	....
27	3.80	3.40	3.30	2.40	1.65	1.47	1.40	....
28	3.80	3.40	3.30	2.50	1.59	1.40	1.35	....
29	3.70	3.40	3.30	2.40	1.60	1.35	....	....
30	....	3.40	3.20	2.20	1.65	1.32	1.32	....
31	....	3.30	....	2.10	1.65	....	1.32	....

Daily discharge, in second-feet, of Old Reservation canal near Wapato, Wash., for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	....	272	272	235	125	68	80	81
2	224	272	272	230	118	68	84	53
3	224	272	272	230	114	68	81	49
4	213	259	272	224	132	68	81	49
5	202	312	272	224	125	122	81	45
6	202	312	285	224	128	122	81	45
7	213	312	285	224	125	122	80	45
8	202	326	285	213	118	118	80	45
9	192	326	285	213	132	122	79	45
10	224	312	292	202	92	132	78	45
11	224	312	282	192	86	128	77	45
12	213	312	272	178	86	111	77	45
13	192	305	259	173	118	111	77	45
14	202	298	192	187	98	111	78	45
15	202	312	192	187	101	111	78	45
16	202	298	192	192	98	104	78	45
17	213	298	192	202	98	106	78	45
18	224	292	192	202	98	108	77	45
19	235	312	187	188	95	110	75	45
20	235	312	182	173	98	110	80	45
21	235	298	197	182	101	92	86	45
22	259	298	197	155	101	92	86	45
23	285	298	202	147	101	92	86	45
24	298	213	202	132	101	92	86	45
25	312	213	192	125	101	92	86	45
26	312	202	202	139	101	92	86	....
27	312	259	247	155	101	90	86	....
28	312	259	247	164	97	86	83	....
29	298	259	247	155	98	83	82	....
30	285	259	235	139	101	81	81	....
31	....	247	....	132	101	....	81	....

NOTE.—Discharge determined from a well-defined rating curve. Discharge interpolated for days when no gage height was reported.

Monthly discharge of Old Reservation canal near Wapato, Wash., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April 2-30	312	192	240	13,800	A.
May	326	202	285	17,500	A.
June	292	182	237	14,100	A.
July	235	125	184	11,300	A.
August	132	86	106	6,520	A.
September	132	68	100	5,950	A.
October	86	75	80.9	4,970	A.
November 1-25	81	45	47.1	2,340	B.
The period				76,500	

YAKIMA RIVER NEAR WAPATO, WASH.

Location.—In sec. 28, T. 12 N., R. 19 E., 500 feet below headgate of Sunnyside Canal, 2 miles below Union Gap, 3 miles north of Wapato, and 8 miles below North Yakima.

Records available.—April 25, 1908, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Cantilever chain. A hook gage indicating head of water flowing over dam has also been read, but the readings do not give a good index of discharge.

Channel.—Rock and gravel; practically permanent.

Discharge measurements.—Made from cable at gage, or by wading.

Winter flow.—Not seriously affected by ice.

Diversions.—Flow affected to a considerable extent by storage and irrigation above the station.

Accuracy.—Records good.

Discharge measurements of Yakima River near Wapato, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*
Oct. 3[a]	F. B. Storey	0.12	105
1911.			
Mar. 20	do	3.98	3,800
1911.		*Feet.*	*Sec.-ft.*
June 3	F. B. Storey	6.72	12,200
July 27[a]	do	1.04	290
Aug. 8[a]	do	-.28	30.2

[a] Measurement not reliable; meter out of order.

Daily gage height, in feet, of Yakima River near Wapato, Wash., for the year ending Sept. 30, 1911.

[Zella B. Newland, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	−0.25	2.64	4.66	3.0	2.5	1.92	4.8	4.4	6.2	3.3	0.20	0.18
2	− .30	2.80	4.49	2.9	2.5	1.95	4.9	4.5	6.8	3.2	− .05	.42
3	+ .10	2.88	4.34	2.8	2.35	2.0	4.9	4.6	6.7	3.1	− .30	.54
4	2.21	2.90	4.24	2.9	2.3	2.1	4.8	4.8	6.2	3.1	+ .40	.72
5	2.55	2.93	4.20	2.8	2.3	2.25	4.5	5.1	5.8	3.0	− .12	1.55
6	2.91	2.83	4.20	2.9	2.35	2.3	4.1	5.1	5.3	3.0	+ .14	1.75
7	3.17	2.98	4.18	3.1	2.3	2.6	4.0	5.0	5.1	2.8	.14	1.50
8	3.42	3.25	4.20	3.2	2.35	2.8	3.8	4.9	5.0	2.7	− .15	1.30
9	3.48	3.94	4.11	3.2	2.3	2.3	3.8	5.0	5.0	2.6	+ .60	1.70
10	3.53	4.18	4.10	3.3	2.3	2.4	3.9	4.6	5.2	2.45	.62	1.95
11	3.38	5.51	4.09	3.3	2.3	2.35	3.9	4.4	5.4	2.3	.82	1.65
12	3.00	5.11	......	3.2	2.15	2.35	3.7	4.3	6.1	2.15	.92	1.50
13	3.10	5.00	3.79	3.1	2.2	2.45	3.5	4.3	6.5	2.0	+ .10	1.50
14	2.91	4.88	3.50	2.9	2.15	2.4	3.3	4.3	6.6	1.90	− .04	1.50
15	2.72	4.44	3.58	2.8	2.1	2.6	3.1	4.2	6.1	1.80	− .46	1.45
16	2.86	3.34	3.54	2.8	1.95	2.9	3.0	4.2	5.6	1.85	− .30	1.60
17	2.78	4.10	3.49	2.7	1.90	3.1	3.1	4.7	5.4	1.95	− .15	1.65
18	2.81	4.05	3.40	2.9	1.90	3.5	3.1	4.9	5.6	2.9	− .18	1.60
19	2.30	3.90	3.15	2.9	1.95	3.6	3.1	5.1	4.9	2.1	− .34	1.60
20	2.60	3.95	3.13	2.8	1.95	3.9	3.1	5.2	4.4	1.60	− .05	1.65
21	2.49	5.18	3.10	2.7	1.95	4.1	3.2	5.0	4.1	1.40	+ .56	1.70
22	2.06	6.96	3.06	2.7	1.95	4.2	3.2	5.0	4.0	1.25	.58	1.70
23	1.80	7.18	3.10	2.5	1.90	4.3	3.6	5.0	4.0	.89	.56	1.95
24	2.31	6.70	3.18	2.6	1.90	4.7	4.2	5.1	4.0	.72	.56	1.95
25	2.44	5.98	3.20	2.6	1.88	4.9	4.7	5.1	3.8	.45	.60	1.90
26	2.60	5.51	3.15	2.5	1.95	4.8	5.1	5.1	3.6	.47	.50	1.80
27	2.62	5.23	3.12	2.6	2.0	4.5	4.9	5.0	3.9	.60	.40	1.75
28	2.64	3.09	3.12	2.6	1.90	4.3	4.8	4.9	3.9	.96	.36	1.35
29	2.65	4.39	3.10	2.5	......	4.2	4.6	4.9	3.8	1.05	.31	1.10
30	2.60	4.65	3.08	2.5	......	4.1	4.4	5.1	3.4	.71	.26	1.15
31	2.54	......	3.05	2.5	......	4.5	......	5.4	......	.48	.24	......

Daily discharge, in second-feet, of Yakima River near Wapato, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	34	1,850	5,620	2,310	1,690	1,090	5,680	4,770	10,000	2,750	125	120
2	26	2,050	5,170	2,180	1,690	1,120	5,940	4,980	12,500	2,600	68	186
3	102	2,150	4,780	2,050	1,520	1,160	5,940	5,200	12,100	2,450	26	226
4	1,370	2,180	4,520	2,180	1,470	1,260	5,680	5,680	10,000	2,450	180	294
5	1,740	2,220	4,420	2,050	1,470	1,420	4,980	6,480	8,610	2,310	54	781
6	2,190	2,090	4,420	2,180	1,520	1,470	4,190	6,480	7,050	2,310	110	940
7	2,560	2,280	4,380	2,450	1,470	1,800	4,000	6,200	6,480	2,050	110	742
8	2,950	2,680	4,420	2,600	1,520	2,050	3,630	5,940	6,200	1,920	49	602
9	3,060	3,890	4,220	2,600	1,470	1,470	3,630	6,200	6,200	1,800	247	900
10	3,140	4,380	4,200	2,750	1,470	1,580	3,810	5,200	6,760	1,640	255	1,120
11	2,890	8,220	4,180	2,750	1,470	1,520	3,810	4,770	7,350	1,470	337	860
12	2,310	6,850	3,900	2,600	1,310	1,520	3,450	4,570	9,660	1,310	383	742
13	2,450	6,520	3,610	2,450	1,360	1,640	3,090	4,570	11,200	1,160	100	742
14	2,190	6,200	3,090	2,180	1,310	1,580	2,750	4,570	11,600	1,070	70	742
15	1,950	5,040	3,230	2,050	1,260	1,800	2,450	4,380	9,660	980	10	706
16	2,130	2,820	3,160	2,050	1,120	2,180	2,310	4,380	7,960	1,020	26	820
17	2,020	4,200	3,070	1,920	1,070	2,450	2,450	5,440	7,350	1,120	49	860
18	2,060	4,100	2,920	2,180	1,070	3,090	2,450	5,940	7,960	2,180	44	820
19	1,470	3,810	2,520	2,180	1,120	3,270	2,450	6,480	5,940	1,260	22	820
20	1,800	3,900	2,500	2,050	1,120	3,810	2,450	6,760	4,770	820	68	860
21	1,680	7,080	2,450	1,920	1,120	4,190	2,600	6,200	4,190	670	233	900
22	1,220	14,500	2,390	1,920	1,120	4,380	2,600	6,200	4,000	570	240	900
23	980	15,700	2,450	1,690	1,070	4,570	3,270	6,200	4,000	368	233	1,120
24	1,480	13,200	2,570	1,800	1,070	5,440	4,380	6,480	4,000	294	233	1,120
25	1,620	9,890	2,600	1,800	1,050	5,940	5,440	6,480	3,630	196	247	1,070
26	1,800	8,220	2,520	1,690	1,120	5,680	6,480	6,480	3,270	202	212	980
27	1,820	7,250	2,480	1,800	1,160	4,980	5,940	6,200	3,810	247	180	940
28	1,850	6,080	2,480	1,800	1,070	4,570	5,680	5,940	3,810	403	169	636
29	1,860	4,910	2,450	1,690	......	4,380	5,200	5,940	3,630	450	155	477
30	1,800	5,590	2,420	1,690	......	4,190	4,770	6,480	2,920	290	141	508
31	1,730	......	2,380	1,690	......	4,980	......	7,350	......	206	136	......

Note.—Discharge determined from a well-defined rating curve. Discharge Nov. 28, 1910, interpolated.

Monthly discharge of Yakima River near Wapato, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	3,140	26	1,820	112,000	A.
November	15,700	1,850	5,660	337,000	A.
December	5,620	2,380	3,400	209,000	A.
January	2,750	1,690	2,100	129,000	A.
February	1,690	1,050	1,300	72,200	A.
March	5,940	1,090	2,920	180,000	A.
April	6,480	2,310	4,050	241,000	A.
May	7,350	4,380	5,770	355,000	A.
June	12,500	2,920	6,890	410,000	A.
July	2,750	196	1,240	76,200	A.
August	383	10	146	8,980	A.
September	1,120	120	751	44,700	A.
The year	15,700	10	3,000	2,180,000	

YAKIMA RIVER NEAR MABTON, WASH.

Location.—In sec. 35, T. 9 N., R. 23 E., at Rocky Fork, 3 miles from Grandview, 4 miles below Mabton, and about 8½ miles above Prosser.

Records available.—June 1 to October 11, 1904; June 8, 1905, to October 12, 1906; July 1 to October 15, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on left bank read after August 1, 1911. Vertical staff on downstream side of highway bridge one-fourth mile below present gage read July 1 to July 31, 1911. Prior to 1911 the gage was a standard chain at Prosser.

Channel.—Rocks and gravel; shifting in floods.

Discharge measurements.—Made from highway bridge one-fourth mile below gage or by wading near gage.

Diversions.—Records affected to a considerable extent by storage and irrigation above the station.

Accuracy.—Records good.

Discharge measurements of Yakima River near Mabton, Wash., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
June 26	Howard Kimble	5.97	3,540
July 19	F. B. Storey	3.90	1,300
29	Paul Taylor	[a]4.66	571
Aug. 1	F. B. Storey	[b]6.27	430
Aug. 22	F. B. Storey	[b]5.98	269
Sept. 30	.....do	[b]6.81	1,020
Oct. 3	W. O. Harmon	[b]6.72	861

[a] Affected by backwater from Prosser dam.

[b] Refer to new gage, above riffle.

Daily gage height, in feet, and discharge, in second-feet, of Yakima River near Mabton, Wash., for July 1 to Oct. 15, 1911.

[R. G. Pettit, observer.]

Day.	July.		August.		September.		October.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	5.7	3,190	6.30	452	6.02	285	6.78	947
2	5.4	2,830	6.20	380	6.02	285	6.75	910
3	5.3	2,720	6.20	380	6.00	276	6.70	848
4	5.2	2,600	6.20	380	6.00	276	6.75	910
5	5.0	2,380	6.10	322	6.20	380	6.80	972
6	4.9	2,270	6.20	380	6.60	734	6.80	972
7	4.8	2,160	6.10	322	6.80	972	6.80	972
8	4.8	2,160	6.10	322	6.80	972	6.80	972
9	4.6	1,950	6.20	380	6.75	910	6.75	910
10	4.5	1,850	6.10	322	6.80	972	6.70	848
11	4.4	1,750	6.10	322	6.80	972	6.70	848
12	4.3	1,660	6.10	322	7.00	1,250	6.70	848
13	4.1	1,470	6.20	380	6.90	1,110	6.68	825
14	4.0	1,380	6.20	380	6.90	1,110	6.67	814
15	3.9	1,290	6.10	322	6.90	1,110	6.67	814
16	3.8	1,210	6.09	317	6.90	1,110		
17	3.8	1,210	6.05	299	6.95	1,180		
18	3.8	1,210	6.03	290	7.00	1,250		
19	4.0	1,380	6.02	285	7.00	1,250		
20	3.7	1,120	5.95	258	7.00	1,250		
21	3.50	970	5.95	258	7.00	1,250		
22	3.50	970	5.97	265	7.00	1,250		
23	3.40	898	6.00	276	7.10	1,400		
24	3.20	760	6.02	285	7.10	1,400		
25	3.00	630	6.05	299	7.15	1,470		
26	2.90	568	6.05	299	7.10	1,400		
27	3.8	569	6.05	299	7.05	1,320		
28	4.1	570	6.05	299	7.00	1,250		
29	4.4	571	6.02	285	6.90	1,110		
30	4.8	531	6.02	285	6.80	972		
31	4.9	491	6.05	299				

NOTE.—Discharge July 1 to 26 determined from a rating curve well defined above 1,000 second feet. Discharge July 27, 28, 30, and 31 interpolated, using measured discharge for July 29. Discharge Aug. 1 to Oct. 15, 1911, determined from a well-defined rating curve.

Monthly discharge of Yakima River near Mabton, Wash., for July 1 to Oct. 15, 1911.

Month.	Discharge in second-feet.			Run-off (in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
July	3,190	491	1,460	89,800	A.
August	452	258	321	19,700	A.
September	1,470	276	1,020	60,700	A.
October 1-15	972	814	894	26,600	A.

YAKIMA RIVER AT KIONA, WASH.

Location.—In sec. 19, T. 9 N., R. 27 E., at the county highway bridge at Kiona, about 5 miles below intake of Kiona canal.

Records available.—August 20, 1895, to September 30, 1911.

Drainage area.—5,230 square miles.

Gage.—Chain attached to upstream guardrail of bridge at same location and datum as old wire and staff gages used prior to May 8, 1906.

Channel.—Rock riffle; practically permanent.

Discharge measurements.—Made from highway bridge or by wading at the riffle 1,000 feet below the gage.

Winter flow.—Not seriously affected by ice.

Diversions.—Records affected to a considerable extent by storage and irrigation above the station.

Accuracy.—Records good.

Discharge measurements of Yakima River at Kiona, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 4	F. B. Storey	3.24	395	June 27	Howard Kimble	6.41	3,580
				Aug. 19	F. B. Storey	2.86	217
1911.				Sept. 2	.....do	3.15	362
Mar. 30	F. B. Storey	7.26	4,780	29	.....do	4.50	1,310

Daily gage height, in feet, of Yakima River at Kiona, Wash., for the year ending Sept. 30, 1911.

[Mrs. J. H. Kennedy, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	3.26	5.30	7.40	5.7	5.1	4.6	7.2	7.4	9.0	6.2	3.5	3.15
2	3.18	5.30	7.30	5.7	5.2	4.6	8.0	7.2	9.9	6.0	3.4	3.05
3	3.20	5.30	7.20	5.5	5.2	4.7	8.3	7.5	10.5	5.8	3.5	3.15
4	3.24	5.30	7.22	5.5	5.0	4.6	8.1	7.8	10.2	5.8	3.65	3.2
5	3.90	5.40	7.24	5.6	5.0	4.6	7.8	8.0	9.6	5.7	3.45	3.35
6	4.94	5.40	7.06	5.5	5.1	4.8	7.5	8.2	9.1	5.8	3.15	3.35
7	5.40	5.40	7.00	5.5	5.1	5.2	7.2	8.2	8.8	5.5	3.2	3.7
8	5.62	5.50	6.86	5.7	5.1	5.3	6.6	8.0	8.3	5.4	3.2	4.0
9	5.90	5.60	6.82	5.8	5.1	5.4	6.8	8.0	8.2	5.2	3.2	4.4
10	5.96	6.50	6.76	5.9	5.0	5.1	6.7	7.9	8.1	5.2	3.1	4.4
11	6.00	6.90	6.52	5.8	5.0	4.9	6.7	7.7	8.4	5.2	3.25	4.4
12	5.94	8.36	6.54	5.8	5.0	5.0	6.6	7.3	8.9	5.0	3.3	4.45
13	5.58	7.94	6.46	5.5	5.0	4.9	6.5	7.2	9.6	5.0	3.3	4.4
14	5.50	7.76	6.36	5.5	5.0	4.9	6.3	7.2	10.1	4.8	3.3	4.45
15	5.40	7.56	6.32	5.3	4.9	5.1	6.1	7.2	10.0	4.6	3.25	4.5
16	5.30	7.02	6.30	5.1	4.9	5.3	5.9	7.1	9.5	4.5	3.2	4.5
17	5.30	6.86	6.22	5.2	4.9	5.5	5.9	7.4	9.1	4.5	3.1	4.45
18	5.40	6.68	6.00	5.3	4.9	5.8	5.9	7.7	8.8	4.5	3.05	4.6
19	5.40	6.66	5.96	5.5	4.9	6.0	6.0	8.0	8.2	4.7	2.95	4.6
20	4.94	6.44	5.84	5.8	4.9	6.6	6.0	8.3	7.8	4.5	3.1	4.6
21	5.12	6.50	5.80	5.5	4.9	6.7	5.9	8.4	7.5	4.25	2.95	4.6
22	5.12	8.52	5.76	5.4	4.9	7.0	5.9	8.1	7.2	4.0	2.73	4.6
23	4.90	10.34	5.72	5.4	4.9	7.2	6.2	8.1	7.0	3.95	3.05	4.6
24	5.10	10.32	5.70	5.4	4.9	7.5	6.6	8.1	7.0	3.8	3.05	4.8
25	5.12	9.76	5.80	5.4	4.8	8.0	6.4	8.2	6.6	3.7	2.90	4.7
26	5.12	9.00	5.90	5.3	4.7	8.0	7.8	8.2	6.6	3.55	3.05	4.7
27	5.20	8.56	5.86	5.3	4.6	7.8	8.1	8.3	6.6	2.68	3.4	4.7
28	5.36	8.12	5.90	5.3	4.6	7.5	8.0	8.2	6.6	2.95	3.25	4.7
29	5.40	7.70	5.86	5.2	....	7.3	7.8	8.1	6.7	3.35	3.15	4.7
30	5.40	7.56	5.86	5.2	....	7.4	7.6	8.1	6.5	3.4	3.2	4.35
31	5.30	....	5.78	5.1	....	7.2	....	8.4	....	3.5	3.25	....

Daily discharge, in second-feet, of Yakima River at Kiona, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	401	2,140	5,600	2,680	1,900	1,380	5,200	5,600	9,100	3,410	540	350
2	363	2,140	5,400	2,680	2,020	1,380	6,800	5,200	11,400	3,100	480	306
3	372	2,140	5,200	2,400	2,020	1,480	7,460	5,800	13,000	2,820	540	350
4	391	2,140	5,240	2,400	1,780	1,380	7,010	6,400	12,100	2,820	635	372
5	810	2,270	5,280	2,540	1,780	1,380	6,400	6,800	10,600	2,680	510	450
6	1,720	2,270	4,920	2,400	1,900	1,580	5,800	7,230	9,350	2,820	350	450
7	2,270	2,270	4,800	2,400	1,900	2,020	5,200	7,230	8,610	2,400	372	670
8	2,570	2,400	4,540	2,680	1,900	2,140	4,090	6,800	7,460	2,270	372	880
9	2,960	2,540	4,470	2,820	1,900	2,270	4,430	6,800	7,230	2,020	372	1,200
10	3,040	3,920	4,360	2,960	1,780	1,900	4,260	6,600	7,010	2,020	328	1,200
11	3,100	4,610	3,950	2,820	1,780	1,680	4,260	6,200	7,690	2,020	496	1,200
12	3,020	7,600	3,990	2,820	1,780	1,780	4,090	5,400	8,850	1,780	420	1,240
13	2,510	6,680	3,850	2,400	1,780	1,680	3,920	5,200	10,600	1,780	420	1,200
14	2,400	6,320	3,680	2,400	1,780	1,680	3,580	5,200	11,900	1,580	420	1,240
15	2,270	5,920	3,610	2,140	1,680	1,900	3,250	5,200	11,600	1,380	496	1,290
16	2,140	4,840	3,580	1,900	1,680	2,140	2,960	5,000	10,400	1,290	372	1,290
17	2,140	4,540	3,440	2,020	1,680	2,400	2,960	5,600	9,350	1,290	328	1,240
18	2,270	4,230	3,100	2,140	1,680	2,820	2,960	6,200	8,610	1,290	306	1,380
19	2,270	4,190	3,040	2,400	1,680	3,100	3,100	6,800	7,230	1,480	268	1,380
20	1,720	3,820	2,880	2,820	1,680	4,090	3,100	7,460	6,400	1,290	328	1,380
21	1,920	3,920	2,820	2,400	1,680	4,260	2,960	7,690	5,800	1,080	268	1,380
22	1,920	7,970	2,760	2,270	1,680	4,800	2,960	7,010	5,200	880	202	1,380
23	1,680	12,500	2,710	2,270	1,680	5,200	3,410	7,010	4,800	845	306	1,380
24	1,900	12,500	2,680	2,270	1,680	5,800	4,090	7,010	4,800	710	306	1,580
25	1,920	11,000	2,820	2,270	1,580	6,800	3,750	7,230	4,090	670	250	1,480
26	1,920	9,100	2,960	2,140	1,480	6,800	6,400	7,230	4,090	570	306	1,480
27	2,020	8,060	2,900	2,140	1,380	6,400	7,010	7,460	4,090	189	480	1,480
28	2,220	7,050	2,960	2,140	1,380	5,800	6,800	7,230	4,090	268	496	1,480
29	2,270	6,200	2,900	2,020	....	5,400	6,400	7,010	4,260	450	350	1,480
30	2,270	5,920	2,900	2,020	....	5,600	6,000	7,010	3,920	480	372	1,160
31	2,140	....	2,790	1,900	....	5,200	....	7,690	....	540	496	....

NOTE.—Discharge determined from a well-defined rating curve.

Monthly discharge of Yakima River at Kiona, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	3,100	363	1,970	121,000	A.
November	12,500	2,140	5,370	320,000	A.
December	5,600	2,680	3,750	231,000	A.
January	2,960	1,900	2,380	146,000	B.
February	2,020	1,380	1,740	96,600	A.
March	6,800	1,380	3,300	203,000	A.
April	7,460	2,960	4,690	279,000	A.
May	7,690	5,000	6,530	402,000	A.
June	13,000	3,920	7,790	464,000	A.
July	3,410	189	1,560	95,900	A.
August	635	250	380	23,400	A.
September	1,580	306	1,110	66,000	A.
The year	13,000	189	3,380	2,450,000	

YAKIMA RIVER NEAR RICHLAND, WASH.

Location.—In sec. 24, T. 9 N., R. 28 E., at highway bridge 1 mile above the mouth of the river and 2 miles east of Richland.

Records available.—1906 to 1911; irrigation season only.

Drainage area.—5,270 square miles.

Gage.—Vertical staff on left upstream caisson of bridge. Gages used in 1906 and 1907 were at Richland Ferry, 2 miles above present gage. New gage installed each year at arbitrary datum.

Channel.—Gravel and cobblestones; practically permanent.

Discharge measurements.—Made from highway bridge or by wading.

Diversions.—Below all diversions and return waters from irrigation in Yakima Valley.

Accuracy.—Records good.

Discharge measurements of Yakima River near Richland, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 21	F. B. Storey	3.96	2,050	Aug. 18	F. B. Storey	2.09	100
				Sept. 1	.....do	2.20	153
1911.				22	.....do	3.42	1,160
July 31	F. B. Storey	[a] 2.34	221				

[a] Gage height determined from a reference point above the influence of backwater from Columbia River.

Daily gage height, in feet, and discharge, in second-feet, of Yakima River near Richland, Wash., for 1911.

[J. B. Clements, observer.]

Day.	July.		August.		September.		October.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1			2.70	215	2.20	145	3.50	1,310
2			2.50	209	2.10	103	3.30	1,050
3			2.40	203	2.30	196	3.15	875
4			2.30	196	2.40	255	3.10	820
5			2.60	390	2.55	355	3.20	930
6			2.20	145	2.40	255	3.20	930
7			2.10	103	2.60	390	2.90	628
8			2.00	70	2.90	628	3.10	820
9			1.90	48	3.50	1,310	3.15	875
10			2.05	86	3.10	820	3.20	930
11			2.10	103	3.20	930	3.20	930
12			2.10	103	3.20	930	3.15	875
13			2.20	145		925	3.10	820
14			2.10	103		980	3.10	820
15			2.05	86		1,000		
16			1.90	48		1,030		
17			1.90	48		1,050		
18			2.05	86		1,080		
19			2.10	103		1,100		
20			2.00	70		1,120		
21			1.90	48		1,150		
22			1.90	48	3.40	1,180		
23			1.85	40	3.50	1,310		
24			1.85	40	3.65	1,520		
25			1.85	40	3.60	1,450		
26			1.85	40	3.60	1,450		
27			1.90	48	3.60	1,450		
28			2.30	196	3.50	1,310		
29			2.15	124	3.40	1,180		
30			2.20	145	3.25	990		
31		221	2.10	103				

NOTE.—Measured discharge used for July 31, 1911. Discharge Aug. 1 to 3, and Sept. 13 to 21, 1911, interpolated. Discharge Aug. 3 to Sept. 12, and Sept. 22 to Oct. 14, 1911, determined from a well-defined rating curve.

Monthly discharge of Yakima River near Richland, Wash., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1911.					
August	390	40	111	6,820	A.
September	1,520	103	921	54,800	B.
October 1-14	1,310	628	901	25,000	A.
The period				86,600	

CABIN CREEK NEAR EASTON, WASH.

Location.—In sec. 9, T. 20 N., R. 13 E., at Northern Pacific Railway bridge half a mile above the mouth of the creek, and about 3 miles west of Easton.

Records available.—May 12, 1909, to September 30, 1911.

Drainage area.—32 square miles.

Gage.—Vertical staff on right end of bridge.

Channel.—Gravel; shifting in floods.

Discharge measurements.—Made from bridge or by wading.

Winter flow.—Not seriously affected by ice.

Diversions.—A 6-inch wooden pipe diverts three-fourths mile above the station for use in locomotives at Easton.

Accuracy.—Records considered fair for October to December, 1910. Estimates January to September, 1911, withheld for further data.

Discharge measurements of Cabin Creek near Easton, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*
Nov. 10	F. B. Storey	2.12	97
1911.			
June 20	G. L. Parker	2.16	116
Sept. 8	F. B. Storey	1.36	14.8

Daily gage height, in feet, of Cabin Creek near Easton, Wash., for the year ending Sept. 30, 1911.

[Chris Atkinson, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.0	1.6	2.5	1.6	1.5	1.7	1.6	2.0	2.6	2.5	1.4	1.0
2	2.1	1.6	2.4	1.8	1.5	1.7	1.6	2.0	2.6	2.4	1.4	1.0
3	2.15	1.7	2.3	2.0	1.5	1.7	1.7	2.1	2.6	2.3	1.35	1.0
4	2.1	1.7	2.2	2.1	1.5	1.7	1.75	2.2	2.55	2.2	1.35	1.0
5	2.0	1.8	2.1	2.3	1.5	1.7	1.8	2.3	2.55	2.0	1.35	1.0
6	1.8	1.9	2.0	2.4	1.5	1.7	1.9	2.45	2.4	1.9	1.35	1.2
7	1.75	1.9	2.0	2.5	1.5	1.6	1.95	2.45	2.3	1.8	1.35	1.4
8	1.6	2.0	1.9	2.5	1.6	1.6	2.0	2.45	2.3	1.7	1.3	1.35
9	1.6	2.0	1.8	2.4	1.6	1.5	2.0	2.4	2.3	1.7	1.3	1.35
10	1.6	2.1	1.8	2.3	1.6	1.4	2.0	2.4	2.3	1.6	1.25	1.4
11	1.6	2.3	1.8	2.2	1.6	1.4	2.0	2.4	2.3	1.55	1.2	1.6
12	1.5	2.4	1.9	2.1	1.6	1.4	1.95	2.4	2.3	1.55	1.2	1.75
13	1.5	2.4	1.9	2.0	1.6	1.4	1.95	2.4	2.25	1.5	1.2	1.9
14	1.5	2.5	1.8	1.9	1.6	1.4	1.9	2.4	2.25	1.5	1.2	2.0
15	1.5	2.6	1.8	2.0	1.6	1.3	1.9	2.4	2.25	1.5	1.2	1.9
16	1.55	2.6	1.7	2.0	1.6	1.3	1.9	2.4	2.25	1.4	1.2	1.8
17	1.55	2.6	1.7	2.1	1.6	1.3	1.9	2.4	2.25	1.4	1.15	1.8
18	1.5	2.5	1.7	2.2	1.6	1.3	1.9	2.45	2.25	1.4	1.15	1.8
19	1.5	2.5	1.7	2.2	1.6	1.45	1.95	2.5	2.3	1.4	1.15	1.75
20	1.5	2.5	1.8	2.1	1.6	1.5	1.95	2.5	2.35	1.4	1.15	1.75
21	1.5	2.7	1.8	2.0	1.6	1.7	1.95	2.55	2.4	1.4	1.15	1.7
22	1.5	2.7	1.9	1.9	1.6	1.8	1.95	2.6	2.45	1.4	1.1	1.6
23	1.5	3.2	1.9	1.8	1.6	1.95	1.95	2.65	2.5	1.4	1.1	1.5
24	1.5	3.2	1.8	1.7	1.6	2.1	1.95	2.7	2.5	1.4	1.1	1.5
25	1.7	3.2	1.8	1.7	1.6	2.3	1.95	2.8	2.5	1.4	1.1	1.5
26	1.65	3.2	1.8	1.6	1.6	2.0	1.85	2.85	2.5	1.4	1.1	1.4
27	1.55	3.1	1.7	1.6	1.6	2.0	1.85	2.95	2.55	1.4	1.1	1.4
28	1.5	2.8	1.6	1.6	1.6	1.95	1.85	2.8	2.55	1.4	1.1	1.4
29	1.5	2.7	1.6	1.6	....	1.8	1.85	2.75	2.55	1.4	1.0	1.4
30	1.55	2.7	1.5	1.6	....	1.8	1.9	2.7	2.55	1.4	1.0	1.4
31	1.55	....	1.5	1.5	....	1.75	....	2.7	....	1.4	1.0	....

NOTE.—The low-water gage heights are somewhat uncertain on account of the question as to the observer's method of reporting them.

Daily discharge, in second-feet, of Cabin Creek near Easton, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1	78	36	193	11	36	133	54	21	28	295	54
2	93	36	159	12	28	159	65	22	28	295	65
3	102	44	133	13	28	159	65	23	28	770	65
4	93	44	110	14	28	193	54	24	28	770	54
5	78	54	93	15	28	237	54	25	44	770	54
6	54	65	78	16	32	237	44	26	40	770	54
7	49	65	78	17	32	237	44	27	32	668	44
8	36	78	65	18	28	193	44	28	28	369	36
9	36	78	54	19	28	193	44	29	28	295	36
10	36	93	54	20	28	193	54	30	32	295	28
								31	32	......	28

NOTE.—Discharge determined from a fairly well defined rating curve.

Monthly discharge of Cabin Creek near Easton, Wash., for the year ending Sept. 30, 1911.

[Drainage area, 32 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	102	28	41.9	1.31	1.51	2,580	C.
November	770	36	261	8.16	9.10	15,500	C.
December	193	28	66.4	2.08	2.40	4,080	C.

KACHESS LAKE NEAR EASTON, WASH.

Location.—In sec. 34, T. 20 N., R. 13 E., at lake outlet, 2½ miles northwest of Easton.

Records available.—September 20, 1905, to September 30, 1911.

Drainage area.—63 square miles.

Gage.—Vertical staff painted on side of gatehouse tower, used after September 6, 1911. Datum is mean sea level. Prior to this date a vertical staff 300 feet above the outlet at datum, 2,226.02 feet higher than present gage.

Artificial control.—Storage in the lake controlled by headgates in dam. Present elevation of sills of gates, 2,192.75 feet, lowered from 2,226 feet in September, 1911.

Daily gage height, in feet, of Kachess Lake near Easton, Wash., for the year ending Sept. 30, 1911.

[H. A. Shandy, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.48	1.61	2.76	1.25	0.99	0.57	1.50	2.30	3.50	5.32	4.23	1.11
2	.58	1.57	2.60	1.19	.98	.54	1.60	2.45	3.70	5.21	4.25	.90
3	1.08	1.60	2.42	1.19	.96	.54	1.62	2.47	3.70	5.05	4.27	.79
4	1.58	1.50	2.32	1.17	.92	.52	1.64	2.51	3.60	5.09	4.29	.51
5	1.77	1.47	2.22	1.17	.90	.50	1.68	2.70	3.47	5.00	4.30	.25
6	1.98	1.48	2.13	1.17	.90	.50	1.68	2.79	3.34	5.03	4.34	26.2
7	2.37	1.56	2.07	1.23	.89	.48	1.65	2.94	3.24	5.16	4.32	26.0
8	2.59	1.82	1.98	1.30	.87	.48	1.63	3.02	3.15	5.28	4.10	25.6
9	2.60	1.95	1.90	1.33	.85	.50	1.60	3.17	3.10	5.20	3.90	25.4
10	2.60	2.09	1.86	1.40	.82	.51	1.61	3.21	3.08	5.10	3.70	25.1
11	2.69	2.45	1.72	1.40	.80	.50	1.64	3.31	3.14	5.03	3.49	24.7
12	2.69	2.63	1.67	1.38	.78	.50	1.63	3.39	3.35	4.98	3.29	24.4
13	2.58	2.63	1.60	1.35	.80	.49	1.60	3.48	3.49	4.89	3.10	24.1
14	2.57	2.60	1.52	1.33	.80	.49	1.58	3.55	4.00	4.80	2.90	23.7
15	2.50	2.62	1.48	1.29	.80	.48	1.54	3.61	4.38	4.70	2.79	23.5
16	2.45	2.70	1.44	1.25	.79	.48	1.50	3.75	4.70	4.60	2.70	23.3
17	2.45	2.69	1.40	1.27	.78	.48	1.49	3.89	4.80	4.49	2.49	23.1
18	2.42	2.70	1.33	1.30	.78	.49	1.50	3.99	5.02	4.40	2.35	22.8
19	2.40	2.70	1.26	1.40	.76	.52	1.50	4.07	5.09	4.23	2.20	22.5
20	2.35	2.83	1.24	1.38	.73	.58	1.47	3.95	5.18	4.19	2.10	22.1
21	2.23	3.70	1.20	1.37	.70	.66	1.47	3.80	5.32	4.10	1.95	21.8
22	2.10	4.31	1.17	1.32	.67	.75	1.49	3.73	5.40	3.99	1.85	21.5
23	1.97	4.37	1.20	1.28	.65	.99	1.51	3.65	5.50	3.98	1.75	21.3
24	1.95	4.17	1.30	1.25	.66	1.08	1.61	3.53	5.47	3.99	1.65	20.9
25	2.00	3.95	1.28	1.20	.64	1.22	1.88	3.49	5.42	4.00	1.54	20.6
26	2.01	3.71	1.28	1.14	.62	1.30	2.00	3.39	5.42	4.05	1.46	20.9
27	1.99	3.47	1.27	1.10	.60	1.40	2.10	3.30	5.47	4.10	1.37	20.9
28	1.95	3.24	1.23	1.06	.58	1.45	2.15	3.18	5.49	4.12	1.29	21.0
29	1.88	3.03	1.25	1.02	......	1.40	2.20	3.15	5.48	4.18	1.25	21.0
30	1.75	2.91	1.30	1.00	......	1.45	2.23	3.18	5.40	4.20	1.17	21.0
31	1.69	......	1.28	1.00	......	1.48	......	3.27	......	4.23	1.08	......

NOTE.—Add 2,200 feet to gage heights after Sept. 5 to give elevations above mean sea level.

Volume of storage on Kachess Lake near Easton, Wash., for Oct. 1, 1910, to Sept. 5, 1911.

Gage height.	Storage.	Gage height.	Storage.	Gage height.	Storage.
Feet.	*Acre-feet.*	*Feet.*	*Acre-feet.*	*Feet.*	*Acre-feet.*
0.00	0	3.00	10,500	6.00	21,100
1.00	3,500	4.00	14,000	7.00	24,700
2.00	7,000	5.00	17,500	8.00	28,400

Volume of storage on Kachess Lake near Easton, Wash., for Sept. 6 to Sept. 30, 1911.

Gage height.	Storage.	Gage height.	Storage.	Gage height.	Storage.
Feet.	*Acre-feet.*	*Feet.*	*Acre-feet.*	*Feet.*	*Acre-feet.*
20.00	77,000	23.00	86,000	26.00	95,000
21.00	80,000	24.00	89,000	27.00	98,000
22.00	83,000	25.00	92,000	28.00	102,000

KACHESS RIVER NEAR EASTON, WASH.

Location.—In sec. 3, T. 20 N., R. 13 E., one-fourth mile below the dam at outlet of Kachess Lake, and about 2½ miles northwest of Easton.

Records available.—October 14, 1903, to September 30, 1911.

Drainage area.—63 square miles.

Gage.—Staff in two sections on left bank; lower section inclined, upper vertical.

Channel.—Gravel; shifting frequently after construction work was started on Kachess dam.

Discharge measurements.—Made from cable at gage.

Winter flow.—Not affected by ice.

Artificial control.—Flow is controlled by storage in Kachess Lake. Records corrected for storage.

Accuracy.—Records good.

The following discharge measurement was made by G. L. Parker:

June 20, 1911: Gage height, 3.92 feet; discharge, 232 second-feet.

Daily gage height, in feet, of Kachess River near Easton, Wash., for the year ending Sept. 30, 1911.

[H. A. Shandy, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.60	4.10	5.03	3.80	3.69	3.41	4.05	4.6	5.7	4.6	2.81	4.4
2	2.60	4.05	4.90	3.81	3.68	3.40	4.1	4.6	5.9	4.6	2.81	4.9
3	2.75	4.08	4.78	3.81	3.66	3.40	4.1	4.8	5.9	3.50	2.81	5.1
4	2.77	4.02	4.70	3.75	3.64	3.39	4.1	4.9	5.8	4.5	2.81	5.1
5	2.81	4.00	4.60	3.75	3.61	3.38	4.15	5.0	5.6	4.45	2.81	5.2
6	3.20	4.00	4.52	3.75	3.61	3.38	4.15	5.1	5.6	4.0	2.81	5.2
7	2.85	4.09	4.47	3.80	3.60	3.37	4.15	3.70	5.5	3.40	2.80	5.2
8	2.60	4.25	4.39	3.86	3.59	3.37	4.1	5.0	5.4	3.46	4.5	5.2
9	4.30	4.39	4.35	3.90	3.58	3.38	4.1	4.4	5.4	4.4	4.7	5.2
10	3.80	4.55	4.30	3.95	3.57	3.38	4.1	4.4	5.4	4.3	4.7	5.2
11	2.80	4.85	4.20	3.95	3.56	3.38	4.1	4.45	5.4	4.3	4.6	5.2
12	4.30	4.98	4.12	3.94	3.55	3.38	4.1	3.97	5.5	4.4	4.6	5.1
13	3.20	4.98	4.08	3.92	3.56	3.37	4.1	3.78	3.50	4.35	4.5	5.2
14	3.00	3.15	4.05	3.90	3.56	3.37	4.1	3.50	2.98	4.5	4.4	5.2
15	4.30	3.20	4.00	3.88	3.56	3.37	4.05	4.25	3.40	4.5	2.99	5.2
16	4.50	3.19	3.98	3.80	3.53	3.37	4.05	4.35	3.40	4.35	4.6	5.2
17	4.55	2.98	3.95	3.82	3.51	3.37	4.0	4.4	3.50	4.35	4.4	5.2
18	4.50	3.40	3.90	3.86	3.51	3.38	4.05	4.45	3.85	4.3	4.3	5.2
19	3.38	3.14	3.86	3.95	3.50	3.40	4.05	6.0	3.90	4.2	4.2	5.1
20	4.28	5.00	3.84	3.94	3.49	3.42	4.0	5.8	3.92	4.2	4.1	5.2
21	4.30	6.08	3.80	3.92	3.48	3.48	4.0	5.8	3.95	4.1	4.05	5.1
22	4.50	6.45	3.78	3.87	3.47	3.52	4.0	5.7	4.0	4.1	4.0	5.1
23	4.40	6.54	3.80	3.84	3.46	3.62	4.05	5.5	4.1	2.97	3.96	5.2
24	4.30	6.32	3.81	3.82	3.46	3.74	4.1	5.4	4.05	2.92	3.89	5.1
25	4.00	6.12	3.80	3.80	3.45	3.88	4.3	5.4	4.3	2.83	3.85	2.74
26	4.00	5.90	3.80	3.78	3.44	3.94	4.4	5.3	4.3	2.83	3.80	......
27	4.02	5.70	3.79	3.77	3.43	3.98	4.5	5.2	4.3	2.82	3.76	......
28	3.90	5.58	3.78	3.74	3.42	4.0	4.6	5.4	4.2	2.82	3.71	......
29	3.85	5.38	3.80	3.72	......	3.98	4.6	5.4	4.4	2.82	3.69	......
30	4.20	5.25	3.85	3.70	......	4.0	4.6	5.4	4.3	2.81	3.65	......
31	4.15	......	3.84	3.70	......	4.0	......	5.5	......	2.81	2.87	......

Daily discharge, in second-feet, of Kachess River near Easton, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	5	266	550	186	158	92	252	410	788	410	13	350
2	5	252	506	189	155	90	266	410	862	410	13	506
3	10	260	468	189	150	90	266	474	862	112	13	574
4	11	244	442	173	146	88	266	506	824	380	13	574
5	13	238	410	173	138	86	280	540	752	365	13	608
6	53	238	386	173	138	86	280	574	752	238	13	608
7	15	263	371	186	136	84	280	160	716	90	12	608
8	5	308	347	202	134	84	266	540	680	103	380	608
9	322	347	336	212	131	86	266	350	680	350	442	608
10	186	395	322	225	129	86	266	350	680	322	442	608
11	12	490	294	225	126	86	266	365	680	322	410	608
12	322	533	272	222	124	86	266	230	716	350	410	574
13	53	533	260	217	126	84	266	181	112	336	380	608
14	27	46	252	212	126	84	266	112	25	380	350	608
15	322	53	238	207	126	84	252	308	90	380	26	608
16	380	52	233	186	119	84	252	336	90	336	410	608
17	395	25	225	191	114	84	238	350	112	336	350	608
18	380	90	212	202	114	86	252	365	199	322	322	608
19	86	45	202	225	112	90	252	900	212	294	294	574
20	316	540	196	222	110	94	238	824	217	294	266	608
21	322	932	186	217	108	108	238	824	225	266	252	574
22	380	1,080	181	204	105	117	238	788	238	266	238	574
23	350	1,120	186	196	103	141	252	716	266	24	228	608
24	322	1,030	189	191	103	170	266	680	252	20	209	574
25	238	948	186	186	101	207	322	680	322	14	199	9.6
26	238	862	186	181	99	222	350	644	322	14	186	0
27	244	788	183	178	97	233	380	608	322	13	176	0
28	212	745	181	170	94	238	410	680	294	13	163	0
29	199	673	186	165	....	233	410	680	350	13	158	0
30	294	626	199	160	....	238	410	680	322	13	148	0
31	280	....	196	160	....	238	....	716	....	13	16	0

NOTE.—Discharge determined from a well-defined rating curve. No flow Sept. 26 to 30.

Monthly discharge of Kachess River near Easton, Wash., for the year ending Sept. 30, 1911.

[Drainage area, 63 square miles.]

Month.	Observed discharge (second-feet).			Run-off (total in acre-feet).			Discharge without storage (second-feet).		Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Observed.	Stored.	Without storage.	Mean.	Per square mile.		
October	395	5	193	11,900	+ 4,550	16,400	267	4.24	4.89	A.
November	1,120	25	467	27,800	+ 4,270	32,100	540	8.57	9.56	A.
December	550	181	277	17,000	− 5,700	11,300	184	2.92	3.37	A.
January	225	160	194	11,900	− 980	10,900	177	2.81	3.24	A.
February	158	94	122	6,780	− 1,470	5,310	95.6	1.52	1.58	A.
March	238	84	125	7,690	+ 3,150	10,800	176	2.79	3.22	A.
April	410	238	284	16,900	+ 2,620	19,500	328	5.21	5.81	A.
May	900	112	516	31,700	+ 3,640	35,300	574	9.11	10.50	A.
June	862	25	432	25,700	+ 7,500	33,200	558	8.86	9.88	A.
July	410	13	219	13,500	− 4,140	9,360	152	2.41	2.78	A.
August	442	12	211	13,000	−11,000	2,000	32.5	.516	.59	A.
September	608	0	467	27,800	−21,200	6,600	111	1.76	1.96	A.
The year	1,120	0	292	212,000	−18,800	193,000	267	4.24	57.38	

NORTH FORK OF CLEALUM RIVER AT GALENA, WASH.

Location.—About one-fourth mile north of Galena, 25 miles north of Roslyn, and 28 miles north of Clealum.

Records available.—June 16 to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff in three sections on left bank.

Channel.—Large bowlders; practically permanent.

Discharge measurements.—Made by wading.

Estimates withheld for additional data.

No discharge measurements made during the year.

Daily gage height, in feet, of North Fork of Clealum River at Galena, Wash., for the year ending Sept. 30, 1911.

[Jack Greiser, observer.]

Day.	June.	July.	Aug.	Sept.	Day.	June.	July.	Aug.	Sept.
1	....	0.5	0.1	−0.2	16	1.5	0.5	−0.3	0.0
2	....	.5	.0	− .2	17	1.3	.6	− .3	.0
3	....	.5	.0	− .2	18	1.0	.6	− .3	.1
4	....	.5	.0	− .1	19	.8	.4	− .3	.2
5	....	.6	.0	− .3	20	.8	.4	− .3	.2
6	....	.6	.0	− .3	21	.8	.3	− .3	.2
7	....	.6	.0	− .2	22	.9	.2	− .3	.2
8	....	.5	− .1	− .2	23	.8	.1	− .3	.2
9	....	.3	− .1	− .2	24	.8	.1	− .3	.2
10	....	.2	− .2	− .2	25	.6	.1	− .3	.2
11	....	.2	− .2	− .3	26	.7	.2	− .3	.1
12	....	.2	− .2	− .3	27	.9	.1	− .3	.0
13	....	.3	− .2	− .2	28	.9	.1	− .3	.0
14	....	.4	− .3	− .2	29	.6	.0	− .3	.0
15	....	.5	− .3	.0	30	.5	.0	− .3	.0
					31	....	.0	− .2	....

NOTE.—Gage heights after Sept. 11 somewhat uncertain on account of question as to observer's method of reporting them.

CLEALUM LAKE NEAR ROSLYN, WASH.

Location.—In sec. 3, T. 20 N., R. 14 E., at lake outlet, 2½ miles northwest of Roslyn, and about 4½ miles northwest of Clealum.

Records available.—January 25 to March 31, 1906; May 4, 1906, to September 30, 1911.

Drainage area.—205 square miles.

Gage.—Vertical staff in three sections at left end of dam.

Artificial control.—Storage in lake controlled by gates in temporary dam.

Daily gage height, in feet, of Clealum Lake near Roslyn, Wash., for the year ending Sept. 30, 1911.

[A. D. Nichols, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.75	8.1	10.45	3.4	8.25	9.35	12.55	13.0	14.25	12.45	8.95	2.45
2	1.8	8.0	10.05	3.4	8.35	9.3	12.7	13.1	14.35	12.4	8.6	3.9
3	2.2	7.75	9.75	3.7	8.4	9.3	12.65	13.15	14.0	12.4	8.1	4.05
4	2.95	7.5	9.45	4.0	8.4	9.3	12.55	13.25	13.6	12.4	7.8	4.15
5	3.3	7.25	9.15	4.0	8.5	9.4	12.45	13.4	13.25	12.4	7.35	4.35
6	3.65	6.7	8.85	4.0	8.55	9.4	12.4	13.3	13.1	12.4	7.3	4.55
7	4.85	6.25	8.65	4.35	8.6	9.4	12.3	13.15	13.1	12.5	7.4	4.75
8	6.4	7.0	8.35	4.75	8.65	9.4	12.3	13.0	13.1	12.4	7.35	4.95
9	7.0	7.8	7.95	4.9	8.7	9.4	12.3	13.0	13.15	12.4	7.5	5.25
10	7.1	8.15	7.6	5.05	8.8	9.45	12.4	12.85	13.25	12.25	7.6	5.4
11	7.05	9.35	7.25	5.45	8.9	9.5	12.4	12.8	13.6	12.2	7.7	5.5
12	7.05	10.0	6.95	5.7	8.9	9.5	12.3	12.7	14.0	12.15	7.8	5.85
13	6.65	10.1	6.6	5.95	9.0	9.4	12.3	12.7	14.2	12.1	7.85	6.0
14	6.35	9.95	6.35	6.1	9.1	9.4	12.2	12.7	14.2	12.2	7.75	6.15
15	6.15	9.75	6.15	6.15	9.1	9.5	12.2	12.7	13.9	12.2	7.55	6.5
16	5.55	9.45	6.0	6.3	9.2	9.55	12.2	12.85	13.7	12.25	7.55	7.0
17	6.15	8.95	5.85	6.5	9.2	9.65	12.15	13.05	13.45	12.3	7.5	7.45
18	7.85	8.45	5.75	6.7	9.2	9.85	12.2	13.15	13.25	12.3	7.25	7.75
19	7.2	8.05	5.6	6.95	9.3	10.15	12.2	13.15	13.05	12.3	6.95	8.05
20	8.15	7.80	5.5	7.1	9.3	10.45	12.2	13.0	12.85	12.2	6.65	8.25
21	8.6	11.35	5.4	7.25	9.3	10.95	12.3	12.95	12.8	12.2	6.45	8.45
22	8.75	13.85	5.2	7.4	9.3	11.55	12.4	13.0	12.8	12.1	6.15	8.65
23	8.4	13.30	4.95	7.5	9.3	12.05	12.55	13.0	12.8	12.05	5.9	8.85
24	8.4	12.65	4.7	7.5	9.3	12.45	12.85	12.95	12.75	12.0	5.7	8.95
25	8.65	12.20	4.4	7.65	9.4	12.5	13.25	12.9	12.65	11.7	5.3	9.1
26	8.85	11.85	4.3	7.8	9.4	12.5	13.3	12.8	12.6	11.6	4.95	9.25
27	9.1	11.55	4.1	7.85	9.4	12.4	13.2	12.8	12.75	10.25	4.6	9.35
28	9.0	11.10	3.8	7.9	9.4	12.3	13.1	12.85	12.7	9.8	4.2	9.5
29	8.9	10.80	3.65	8.0	....	12.2	13.0	12.95	12.65	9.6	3.85	9.6
30	8.75	10.65	3.6	8.05	....	12.3	13.0	13.25	12.55	9.25	3.65	9.6
31	8.45	....	3.5	8.15	....	12.4	....	13.7	....	9.05	2.9	....

Volume of storage on Clealum Lake near Roslyn, Wash., for the year ending Sept. 30, 1911.

Gage height.	Storage.	Gage height.	Storage.	Gage height.	Storage.	Gage height.	Storage.
Feet.	*Acre-feet.*	*Feet.*	*Acre-feet.*	*Feet.*	*Acre-feet.*	*Feet.*	*Acre-feet.*
1.00	1,700	5.00	9,600	9.00	18,600	13.00	28,100
2.00	3,600	6.00	11,800	10.00	20,900	14.00	30,500
3.00	5,500	7.00	14,000	11.00	23,300	15.00	33,000
4.00	7,500	8.00	16,300	12.00	25,700	16.00	35,500

NOTE.—This table has been used to determine the amount of water in, or drawn from, the lake, and in connection with the records on Clealum River, to compute the inflow into the lake. This table differs slightly from that published in Water-Supply Paper 252. It is, however, the same as used by the United States Reclamation Service.

CLEALUM RIVER NEAR ROSLYN, WASH.

Location.—In sec. 10, T. 20 N., R. 14 E., 500 feet below the dam at outlet of Clealum Lake, 2½ miles northwest of Roslyn, and about 4½ miles northwest of Clealum.

Records available.—October 10, 1903, to September 30, 1911.

Drainage area.—205 square miles.

Gage.—Inclined staff on left bank.

Channel.—Gravel and bowlders; practically permanent.

Discharge measurements.—Made from cable or by wading near gage.

Winter flow.—Not affected by ice.

Artificial control.—Flow is controlled by storage in Clealum Lake. Records corrected for storage.

Accuracy.—Records good.

Discharge measurements of Clealum River near Roslyn, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 7	F. B. Storey	3.52	1,070	June 17	G. L. Parker	5.18	2,340
Nov. 23	.....do	6.30	3,330	Sept. 6	F. B. Storey	1.04	108

Daily gage height, in feet, of Clealum River near Roslyn, Wash., for the year ending Sept. 30, 1911.

[A. D. Nichols, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.43	2.92	3.50	2.4	1.30	1.30	3.7	4.5	6.5	3.4	2.8	2.35
2	1.58	2.82	3.46	2.35	1.35	1.30	3.8	4.6	6.6	3.4	2.9	1.30
3	2.00	3.02	3.42	2.1	1.35	1.30	3.8	4.7	6.1	3.4	3.1	1.25
4	2.72	2.90	3.39	1.9	1.35	1.30	3.7	4.9	5.4	3.4	3.1	1.25
5	3.06	2.88	3.35	1.95	1.40	1.30	3.5	5.1	4.9	3.3	3.1	1.25
6	3.24	3.22	3.32	1.95	1.40	1.35	3.3	4.9	4.6	3.4	2.7	1.05
7	3.54	3.58	3.29	1.85	1.45	1.35	3.2	4.6	4.6	3.5	2.3	.90
8	3.76	3.72	3.26	1.85	1.30	1.35	3.1	4.5	4.6	3.4	2.0	.90
9	3.83	3.78	3.21	1.95	1.12	1.35	3.2	4.4	4.7	3.2	1.5	.90
10	3.84	3.85	3.16	1.75	1.15	1.35	3.4	4.1	4.8	3.1	1.5	.90
11	3.79	3.94	3.11	1.55	1.20	1.35	3.3	4.0	5.5	2.9	1.5	.90
12	3.86	4.04	3.04	1.5	1.20	1.35	3.2	4.0	6.1	2.9	1.5	.90
13	3.75	4.06	3.00	1.35	1.25	1.35	3.1	3.9	6.5	2.9	1.5	.90
14	3.88	4.01	2.92	1.31	1.20	1.35	2.9	3.9	6.5	2.9	2.1	.90
15	3.71	3.97	2.78	1.40	1.25	1.40	2.9	3.9	6.1	3.0	2.5	1.15
16	3.68	3.92	2.59	1.40	1.25	1.45	2.9	4.2	5.6	3.1	2.0	1.30
17	2.10	3.88	2.57	1.40	1.30	1.5	2.9	4.5	5.2	3.2	2.0	1.10
18	.67	3.82	2.41	1.40	1.30	1.35	3.0	4.7	4.8	3.2	2.25	1.10
19	.84	3.74	2.37	1.45	1.30	1.24	3.0	4.6	4.5	3.2	2.5	1.10
20	.88	3.70	2.35	1.5	1.30	1.35	3.0	4.4	4.2	3.0	2.5	1.10
21	.92	5.70	2.42	1.5	1.35	1.35	3.1	4.3	4.0	2.9	2.5	1.10
22	2.07	7.12	2.44	1.45	1.35	1.65	3.3	4.4	4.1	2.8	2.5	1.00
23	3.00	6.30	2.46	1.5	1.35	2.7	3.7	4.4	4.1	2.7	2.5	1.00
24	2.92	5.38	2.66	1.40	1.35	3.5	4.3	4.3	4.0	2.9	2.5	1.00
25	3.15	4.74	2.72	1.40	1.35	3.7	4.8	4.2	3.8	3.3	2.5	1.00
26	3.20	4.24	2.68	1.40	1.35	3.5	4.9	4.1	3.7	3.5	2.5	.85
27	3.22	3.94	2.66	1.40	1.35	3.4	4.8	4.0	3.9	3.7	2.5	.74
28	3.15	3.77	2.64	1.32	1.35	3.2	4.6	4.1	4.0	3.5	2.5	.75
29	3.16	3.60	2.54	1.35	....	3.0	4.4	4.4	3.8	3.2	2.4	.75
30	3.07	3.54	2.50	1.40	....	3.1	4.4	4.8	3.6	3.1	2.3	1.6
31	2.98	....	2.45	1.35	....	3.4	....	5.6	....	2.9	2.35	....

Daily discharge, in second-feet, of Clealum River near Roslyn, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	184	720	1,030	492	156	156	1,150	1,680	3,750	970	660	474
2	223	670	1,010	474	166	156	1,210	1,760	3,870	970	710	156
3	354	770	982	388	166	156	1,210	1,840	3,270	970	810	146
4	624	710	964	320	166	156	1,150	2,020	2,500	970	810	146
5	795	700	940	337	177	156	1,030	2,200	2,020	910	810	146
6	880	870	922	337	177	166	910	2,020	1,760	970	615	115
7	1,050	1,080	905	304	188	166	860	1,760	1,760	1,030	457	95
8	1,190	1,160	890	304	156	166	810	1,680	1,760	970	354	95
9	1,230	1,200	865	337	125	166	860	1,600	1,840	860	200	95
10	1,230	1,240	840	274	130	166	970	1,390	1,930	810	200	95
11	1,200	1,290	815	214	137	166	910	1,330	2,610	710	200	95
12	1,250	1,350	780	200	137	166	860	1,330	3,270	710	200	95
13	1,180	1,370	760	166	146	166	810	1,270	3,750	710	200	95
14	1,260	1,340	725	158	137	166	710	1,270	3,750	710	388	95
15	1,160	1,310	651	177	146	177	710	1,270	3,270	760	530	130
16	1,140	1,280	566	177	146	188	710	1,460	2,720	810	354	156
17	388	1,260	558	177	156	200	710	1,680	2,300	860	354	122
18	70	1,220	496	177	156	166	760	1,840	1.930	860	440	122
19	88	1,170	482	188	156	145	760	1,760	1,680	860	530	122
20	93	1,150	474	200	156	166	760	1,600	1,460	760	530	122
21	98	2,830	500	200	166	166	810	1,530	1,330	710	530	122
22	378	4,540	507	188	166	244	910	1,600	1,390	660	530	108
23	760	3,510	515	200	166	615	1,150	1,600	1,390	615	530	108
24	720	2,480	597	177	166	1.030	1,530	1,530	1,330	710	530	108
25	835	1,880	624	177	166	1,150	1,930	1,460	1,210	910	530	108
26	860	1,490	606	177	166	1,030	2,020	1,390	1,150	1,030	530	89
27	870	1,290	597	177	166	970	1,930	1,330	1,270	1,150	530	77
28	835	1,190	588	160	166	860	1,760	1,390	1,330	1,030	530	78
29	840	1,090	546	166	....	760	1,600	1,600	1.210	860	492	78
30	795	1,050	530	177	....	810	1,600	1,930	1,090	810	457	229
31	750	....	511	166	....	970	....	2,720	....	710	474	....

NOTE.—Discharge determined from a rating curve well defined above 200 second-feet.

Monthly discharge of Clealum River near Roslyn, Wash., for the year ending Sept. 30, 1911.

[Drainage area 205 square miles.]

Month.	Observed discharge (second-feet).			Run-off (total in acre-feet).			Discharge without storage (second-feet).		Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Observed.	Stored.	Without storage.	Mean.	Per square mile.		
October	1,260	70	753	46,300	+14,300	60,600	986	4.81	5.54	B.
November	4,540	670	1,440	85,700	+ 5,120	90,800	1,530	7.46	8.32	A.
December	1,030	474	702	43,200	−16,000	27,200	442	2.16	2.49	A.
January	492	160	238	14,600	+10,100	24,700	402	1.96	2.26	A.
February	188	125	157	8,720	+ 2,880	11,600	209	1.02	1.06	A.
March	1,150	145	385	23,700	+ 7,140	30,800	501	2.44	2.81	A.
April	2,020	710	1,100	65,500	+ 1,440	66,900	1,120	5.46	6.09	A.
May	2,720	1,270	1,640	101,000	+ 1,680	103,000	1,680	8.20	9.45	A.
June	3,870	1,090	2,130	127,000	− 2,760	124,000	2,080	10.1	11.27	A.
July	1,150	615	851	52,300	− 8,300	44,000	716	3.49	4.02	A.
August	810	200	484	29,800	−13,400	16,400	267	1.30	1.50	A.
September	474	77	127	7,560	+14,700	22,300	375	1.83	2.04	B.
The year	4,540	70	836	605,000	+16,900	622,000	857	4.18	56.85	

TEANAWAY RIVER BELOW FORKS, NEAR CLEALUM, WASH.

Location.—In the NE. ¼ sec. 9, T. 20 N., R. 16 E., about 1 mile below the junction of the Middle and North forks of Teanaway River and 5 miles northeast of Clealum.

Records available.—June 15 to September 30, 1911.

Drainage area.—177 square miles.

Gage.—Vertical staff on left bank.

Channel.—Rocks and gravel; shifting in floods.

Discharge measurements.—Made from cable 1,000 feet below gage or by wading near gage.

Diversions.—About 10 second-feet diverted above the station for irrigation.

Estimates withheld for additional data.

Discharge measurements of Teanaway River below forks, near Clealum, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
1911.		*Feet.*	*Sec.-ft.*
June 15	Howard Kimble	2.47	476
July 10	....do	.87	89.2
Aug. 3	F. B. Storey	.56	25.1

Daily gage height, in feet, of Teanaway River below forks, near Clealum, Wash., for the year ending Sept. 30, 1911.

[Wilhelm Krueger, observer.]

Day.	June.	July.	Aug.	Sept.	Day.	June.	July.	Aug.	Sept.
1	....	1.3	....	0.28	16	2.4	0.78	0.48	0.92
2	....	1.3	....	.28	17	2.1	.78	.48	.89
3	....	1.25	0.57	.30	18	1.95	.73	.48	.86
4	....	1.2	.88	.34	19	1.75	.70	.48	.79
5	....	1.15	.82	.38	20	1.65	.70	.48	.76
6	....	1.05	.64	.55	21	1.7	.68	.48	.74
7	....	1.0	.60	.60	22	1.7	.68	.42	.72
8	....	1.0	.60	.60	23	1.7	.64	.45	.70
9	....	.90	.58	.68	24	1.5	.61	.44	.70
10	....	.85	.54	.69	25	2.0	.54	.44	.68
11	....	.82	.50	.65	26	1.75	.51	.44	.66
12	....	.80	.45	.73	27	1.75	....	.42	.65
13	....	.80	.46	.79	28	1.55	....	.40	.64
14	....	.81	.48	.74	29	1.5	....	.30	.60
15	2.4	.80	.48	.80	30	1.35	....	.30	59
					31	1.3	....	.28	....

TEANAWAY RIVER NEAR CLEALUM, WASH.

Location.—In the NE. ¼ sec. 3, T. 19 N., R. 16 E., at the highway bridge, half a mile above the mouth of the river and 4½ miles east of Clealum.

Records available.—April 2, 1909, to October 15, 1911.

Drainage area.—214 square miles.

Gage.—Chain attached to guard rail of highway bridge.

Channel.—Clay and gravel; shifting.

Discharge measurements.—Made from highway bridge at gage or by wading near gage.

Winter flow.—Seriously affected by ice and estimated by comprison with records of streams in adjacent watersheds.

Diversions.—Station is below all diversions and return waters. A considerable part of the summer run-off is diverted for irrigation.

Accuracy.—Results fair.

Discharge measurements of Tenanaway River near Clealum, Wash., in the period Oct. 1, 1910, to Oct. 15, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Nov. 23	F. B. Storey	4.71	975	June 14	G. L. Parker	4.57	480
				21	.....do	3.87	184
1911.				July 13	Howard Kimble	3.35	38.2
May 11	.....do	4.77	540	Aug. 3	F. B. Storey	3.16	13.2
23	Howard Kimble	4.62	520	Oct. 4	W. O. Harmon	3.29	26.4

Daily gage height, in feet, of Teanaway River near Clealum, Wash., for Oct. 1, 1910, to Oct. 15, 1911.

[Athene Clymer, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	1.68	2.51	3.66	2.93	2.95	2.54	5.8	......	5.35	3.76	3.16	3.00	3.27
2	1.68	2.50	3.60	2.77	2.79	2.78	5.6	......	5.35	3.72	3.15	3.00	3.30
3	2.64	2.53	3.52	2.96	2.72	2.83	5.3	......	4.85	3.70	3.17	3.02	3.29
4	3.49	2.51	3.52	3.17	2.80	2.92	4.85	......	4.75	3.68	3.17	3.00	3.30
5	3.35	2.47	3.48	3.14	2.90	2.90	4.30	......	4.55	3.65	3.37	2.98	3.29
6	3.39	2.56	3.47	3.17	2.95	2.89	4.27	......	4.47	3.55	3.32	3.09	3.29
7	3.60	2.80	3.44	3.72	2.91	2.96	3.95	......	4.5	3.51	3.27	3.20	3.28
8	3.52	3.78	3.43	3.79	2.89	3.05	4.7	......	4.43	3.53	3.23	3.33	3.25
9	3.40	3.57	3.42	3.70	2.86	2.80	4.44	......	4.49	3.47	3.22	3.37	3.25
10	3.25	3.53	3.38	3.60	2.83	2.94	4.31	......	4.55	3.46	3.24	3.37	3.25
11	3.12	3.98	3.31	3.49	2.87	2.84	4.15	4.75	4.65	3.43	3.18	3.35	3.24
12	2.98	3.86	3.33	3.41	2.66	2.79	4.00	4.8	4.9	3.38	3.17	3.33	3.24
13	2.90	3.72	3.27	3.13	2.90	2.79	3.90	4.75	4.75	3.33	3.13	3.45	3.23
14	2.80	3.50	3.24	3.17	2.86	3.03	3.77	4.7	4.65	3.31	3.12	3.38	3.24
15	2.95	3.40	3.21	3.18	2.63	3.57	3.92	4.7	4.5	3.33	3.13	3.40	3.25
16	2.68	3.33	3.19	3.38	2.46	3.70	3.75	4.95	4.40	3.34	3.10	3.48	......
17	2.67	3.30	3.18	3.24	2.86	4.02	3.78	4.95	4.32	3.34	3.11	3.49	......
18	2.99	3.29	3.17	3.14	2.84	4.17	4.30	5.0	4.20	3.32	3.11	3.45	......
19	2.86	3.37	3.10	3.16	2.75	4.20	4.12	4.85	4.13	3.33	3.11	3.43	......
20	2.64	3.22	3.07	......	2.59	4.95	4.10	4.8	4.04	3.30	3.12	3.40	......
21	2.77	6.15	3.05	3.12	2.90	4.9	......	4.8	3.94	3.25	3.06	3.39	......
22	2.72	5.30	3.00	3.04	2.79	5.1	4.8	4.9	......	3.23	3.04	3.37	......
23	2.70	4.75	3.20	2.98	2.60	5.7	4.8	5.1	3.93	3.20	3.07	3.36	......
24	2.64	4.40	3.34	3.08	2.76	5.25	4.9	4.55	4.9	3.21	3.04	3.35	......
25	2.67	4.20	3.20	3.11	2.84	4.85	5.45	4.6	4.85	3.21	3.08	3.33	......
26	2.65	3.98	3.25	2.96	2.76	4.5	......	4.6	3.87	3.21	3.06	3.33	......
27	2.60	3.90	3.20	3.09	2.60	4.40	......	4.65	3.98	3.22	3.06	3.33	......
28	2.58	3.77	3.19	2.89	2.59	4.24	......	4.65	3.87	3.22	3.04	3.33	......
29	2.55	3.76	3.16	2.80	......	4.48	......	4.65	3.87	3.21	2.97	3.27	......
30	2.53	3.64	3.17	3.00	......	5.35	......	4.75	3.76	3.20	2.99	3.29	......
31	2.51	......	3.14	3.00	......	5.35	......	5.05	......	3.20	2.99	......	......

NOTE.—Probably no ice during December, 1910. A little ice Jan. 2 to Mar. 6, 1911, but no serious effect except January 7 to 12, when there was backwater effect.

Daily discharge, in second-feet, of Teanaway River near Clealum, Wash., for Oct. 1, 1910, to Oct. 15, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	7.4	68	371	141	145	73	1,990	1,220	959	132	14	5.0	25
2	7.4	67	346	109	112	111	1,770	1,160	959	119	13	5.0	28
3	87	71	308	147	100	120	1,470	1,090	620	113	15	5.9	27
4	304	68	316	200	114	138	1,080	1,030	564	107	15	5.0	28
5	256	63	301	192	134	134	694	960	460	99	38	4.6	27
6	270	75	298	200	145	132	675	894	421	74	31	9.0	27
7	383	114	287	190	136	147	498	828	435	64	25	17	26
8	316	421	284	190	132	168	970	762	401	69	20	32	22
9	273	335	280	190	126	114	788	696	430	56	19	38	22
10	224	319	266	190	120	143	701	630	460	54	21	38	22
11	186	513	242	190	128	122	603	564	511	49	16	36	21
12	152	457	249	190	91	112	522	591	648	40	15	32	21
13	134	396	230	189	134	112	475	564	564	32	12	52	20
14	114	308	221	200	126	163	417	537	511	30	11	40	21
15	145	273	212	203	86	335	484	537	435	32	12	43	22
16	94	249	206	266	62	387	408	678	387	34	9.5	58	......
17	92	239	203	221	126	532	421	678	350	34	10	60	......
18	154	236	200	192	122	615	694	708	297	31	10	52	......
19	126	263	180	197	106	632	586	620	268	32	10	49	......
20	87	215	173	192	80	1,260	574	591	233	28	11	43	......
21	109	2,420	168	186	134	1,220	807	591	195	22	7.7	42	......
22	100	1,420	156	166	112	1,290	1,040	648	193	20	6.8	38	......
23	97	1,010	209	152	81	1,880	1,040	772	191	17	8.2	37	......
24	87	760	253	175	107	1,420	1,220	460	648	18	6.8	36	......
25	92	632	209	183	122	1,080	1,620	485	620	18	8.6	32	......
26	89	513	224	147	107	830	1,550	485	170	18	7.7	32	......
27	81	475	209	178	81	760	1,490	511	210	19	7.7	32	......
28	78	417	206	132	80	657	1,420	511	170	19	6.8	32	......
29	74	413	197	114	......	816	1,360	511	170	18	4.4	25	......
30	71	362	200	156	......	1,520	1,290	564	132	17	4.8	27	......
31	68	......	192	156	......	1,520	......	740	......	17	4.8	......	......

NOTE.—Discharge Oct. 1, 1910, to Jan. 6, 1911, and Jan. 13 to Apr. 25, 1911, determined from a fairly well defined rating curve. Discharge Jan. 7 to 12, 1911, estimated because of ice. Discharge Apr. 26 to May 10, 1911, interpolated. Discharge May 11 to Oct. 15, 1911, determined from a rating curve well defined above 10 second-feet.

Monthly discharge of Teanaway River near Clealum, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	383	7.4	141	8,670	B.
November	2,420	63	439	26,100	B.
December	371	156	239	14,700	B.
January	266	109	179	11,000	C.
February	145	62	112	6,220	B.
March	1,880	73	598	36,800	B.
April	1,990	408	955	56,800	C.
May	1,220	460	697	42,900	C.
June	959	132	420	25,000	A.
July	132	17	46.2	2,840	A.
August	38	4.4	13.0	799	B.
September	60	4.6	31.9	1,900	A.
The year	2,420	4.4	323	234,000	

SWAUK CREEK NEAR CLEALUM, WASH.

Location.—In the SE. ¼ sec. 5, T. 19 N., R. 17 E., 2½ miles above the mouth of the creek and 12 miles east of Clealum.

Records available.—April 3, 1909, to September 30, 1911.

Drainage area.—90 square miles.

Gage.—Vertical staff on right bank.

Channel.—Gravel and small bowlders; shifting.

Discharge measurements.—Made from wagon bridge above the gage, or by wading at gage.

Winter flow.—Not seriously affected by ice.

Diversions.—Station below all diversions and return waters. A considerable part of the flow is diverted above the station for irrigation, some of it being taken into the Kittitas Valley.

Accuracy.—Results fair.

Discharge measurements of Swauk Creek near Clealum, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 27	F. B. Storey	2.48	137
June 21	G. L. Parker	1.43	13.3

Daily gage height, in feet, of Swauk Creek, near Clealum, Wash., for the year ending Sept. 30, 1911.

[B. F. Boice, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.22	1.32	1.52	1.44	1.46	1.35	2.85	2.25	2.0	1.48	1.18	1.10
2	1.22	1.33	1.51	1.46	1.49	1.31	2.85	2.25	1.99	1.48	1.20	1.10
3	1.24	1.34	1.50	1.50	1.52	1.35	2.8	2.15	1.99	1.46	1.20	1.10
4	1.40	1.36	1.51	1.45	1.50	1.40	2.7	2.25	2.0	1.41	1.30	1.12
5	1.40	1.36	1.51	1.50	1.50	1.45	2.4	2.25	1.92	1.40	1.30	1.13
6	1.34	1.38	1.51	1.45	1.45	1.45	2.35	2.2	1.87	1.38	1.30	1.14
7	1.31	1.40	1.51	1.46	1.45	1.46	2.3	2.2	1.82	1.36	1.30	1.16
8	1.32	1.40	1.51	1.56	1.40	1.48	2.3	2.3	1.80	1.36	1.30	1.19
9	1.29	1.42	1.51	1.59	1.38	1.50	2.35	2.25	1.76	1.36	1.31	1.24
10	1.27	1.43	1.51	1.56	1.38	1.55	2.35	2.2	1.72	1.36	1.31	1.28
11	1.27	1.45	1.51	1.50	1.40	1.52	2.3	2.1	1.75	1.34	1.31	1.28
12	1.27	1.45	1.51	1.50	1.40	1.60	2.3	2.05	1.74	1.32	1.31	1.28
13	1.27	1.50	1.51	1.50	1.41	1.70	2.05	2.05	1.72	1.32	1.31	1.29
14	1.27	1.61	1.56	1.50	1.42	1.83	2.1	2.05	1.70	1.31	1.30	1.29
15	1.27	1.68	1.52	1.50	1.47	2.0	2.1	2.05	1.66	1.30	1.30	1.30
16	1.27	1.69	1.50	1.51	1.45	2.2	2.1	2.05	1.62	1.29	1.28	1.30
17	1.28	1.74	1.50	1.53	1.43	2.35	2.1	2.1	1.60	1.26	1.25	1.30
18	1.32	1.92	1.44	1.54	1.45	2.5	2.1	2.1	1.60	1.20	1.22	1.30
19	1.32	1.98	1.42	1.60	1.42	2.6	2.1	2.05	1.56	1.19	1.22	1.30
20	1.32	2.12	1.42	1.55	1.37	2.7	2.15	2.05	1.55	1.15	1.20	1.30
21	1.32	2.23	1.43	1.55	1.36	2.8	2.2	2.0	1.54	1.15	1.20	1.30
22	1.31	2.09	1.44	1.53	1.37	2.8	2.3	2.0	1.52	1.15	1.19	1.30
23	1.31	2.08	1.46	1.55	1.32	3.0	2.4	2.0	1.53	1.15	1.16	1.30
24	1.31	2.06	1.46	1.50	1.31	3.0	2.5	2.1	1.55	1.14	1.14	1.31
25	1.31	2.04	1.45	1.50	1.37	2.9	2.7	2.1	1.59	1.16	1.14	1.31
26	1.31	2.10	1.44	1.50	1.36	2.75	2.6	2.1	1.60	1.16	1.13	1.31
27	1.31	2.09	1.44	1.48	1.36	2.55	2.5	2.05	1.60	1.16	1.12	1.32
28	1.31	1.72	1.44	1.42	1.38	2.45	2.4	2.0	1.61	1.16	1.12	1.32
29	1.32	1.53	1.43	1.47	......	2.45	2.3	2.0	1.62	1.18	1.11	1.32
30	1.32	1.52	1.43	1.56	......	2.6	2.25	2.0	1.58	1.18	1.10	1.32
31	1.32	......	1.43	1.57	......	2.75	......	2.0	......	1.18	1.10	......

Daily discharge, in second-feet, of Swauk Creek near Clealum, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	7	13	28	22	23	15	196	100	67	17	1.7	0.5
2	7	14	27	23	25	12	196	100	66	17	2.0	.5
3	8	14	27	26	28	15	187	86	66	15	2.0	.5
4	19	16	27	22	26	19	169	100	67	11	5.0	.8
5	19	16	27	26	26	22	121	100	58	11	5.0	1.0
6	14	17	27	22	22	22	114	93	53	9.5	5.0	1.1
7	12	19	27	23	22	23	107	93	48	8.4	5.0	1.4
8	12	19	27	31	19	25	107	107	46	8.4	5.0	1.8
9	11	20	27	33	17	26	114	100	42	8.4	5.6	3.2
10	10	21	27	31	17	30	114	93	38	8.4	5.6	4.4
11	10	22	27	26	19	28	107	80	41	7.2	5.6	4.4
12	10	22	27	26	19	34	107	74	40	6.1	5.6	4.4
13	10	26	27	26	19	43	74	74	38	6.1	5.6	4.7
14	10	35	31	26	20	56	80	74	36	5.6	5.0	4.7
15	10	41	28	26	24	73	80	74	32	5.0	5.0	5.0
16	10	42	26	27	22	95	80	74	29	4.7	4.4	5.0
17	10	47	26	28	21	115	80	80	27	3.8	3.5	5.0
18	13	65	22	29	22	137	80	80	27	2.0	2.6	5.0
19	13	71	20	34	20	153	80	74	24	1.8	2.6	5.0
20	13	86	20	30	17	170	86	74	23	1.2	2.0	5.0
21	13	99	21	30	16	188	93	67	22	1.2	2.0	5.0
22	12	83	22	28	17	188	107	67	20	1.2	1.8	5.0
23	12	82	23	30	13	226	121	67	21	1.2	1.4	5.0
24	12	80	23	26	12	226	136	80	23	1.1	1.1	5.6
25	12	77	22	26	17	206	169	80	26	1.4	1.1	5.6
26	12	84	22	26	16	178	152	80	27	1.4	1.0	5.6
27	12	83	22	25	16	144	136	74	27	1.4	.8	6.1
28	12	45	22	20	17	128	121	67	28	1.4	.8	6.1
29	13	28	21	24	......	128	107	67	29	1.7	.6	6.1
30	13	28	21	31	......	152	100	67	25	1.7	.5	6.1
31	13	......	21	32	......	178	......	67	......	1.7	.5	......

NOTE.—Discharge determined from two fairly well defined rating curves.

Monthly discharge of Swauk Creek near Clealum, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	19	7	11.7	719	A.
November	99	13	43.8	2,610	A.
December	31	20	24.7	1,520	B.
January	34	20	26.9	1,650	C.
February	28	12	19.7	1,090	B.
March	226	12	98.5	6,060	B.
April	196	74	117	6,960	B.
May	107	67	81.1	4,990	B.
June	67	20	37.2	2,210	A.
July	17	1.1	5.58	343	B.
August	5.6	.5	3.08	189	C.
September	6.1	.5	3.99	237	C.
The year	226	.5	39.5	28,600	

TANEUM CREEK NEAR THORP, WASH.

Location.—In sec. 6, T. 18 N., R. 17 E., at the De Shazer ranch, 6 miles northwest of Thorp.

Records available.—April 4, 1909, to September 30, 1911.

Drainage area.—76 squre miles.

Gage.—Vertical staff on left bank. Prior to November, 1910, a vertical staff on the left bank one-fourth mile above present location.

Channel.—Gravel; practically permanent.

Discharge measurements.—Made from foot logs or by wading near gage.

Winter flow.—Seriously affected by ice.

Diversons.—Above all diversions except Bruton canal, which diverts 300 feet above the station for irrigation.

Estimates withheld for further data.

Discharge measurements of Taneum Creek near Thorp, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet..*	*Sec.-ft.*
1910. Nov. 16	F. B. Storey	0.83	18.5	1911. Apr. 26	F. B. Storey	1.63	155
				June 2	Howard Kimble	2.15	235
1911. Apr. 3	do	1.48	80.9	Aug. 4	F. B. Storey	.62	9.1

Daily gage height, in feet, of Taneum Creek near Thorp, Wash., for the year ending Sept. 30, 1911.

[Warren De Shazer, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1			0.87	0.93	0.92	0.92	1.46	1.50	1.95	1.11	0.62	0.50
2			.86	.91	.91	.90	1.45	1.50	2.00	1.12	.62	.50
3			.89	.91	.93	.91	1.50	1.50	2.00	1.12	.63	.50
4			.87	.90	.93	.91	1.40	1.56	1.80	1.11	.63	.50
5			.85	.83	.93	.90	1.40	1.58	1.75	.92	.63	.60
6			.85	.80	.94	.85	1.45	1.54	1.70	.91	.63	.70
7			.85	.83	.92	.75	1.37	1.56	1.63	.85	.63	.75
8			.85	.93	.91	.74	1.37	1.64	1.53	.85	.63	.80
9			.83	.90	.91	.74	1.35	1.54	1.57	.84	.63	.78
10			.80	.95	.90	.74	1.30	1.51	1.55	.83	.62	.78
11			.80	.95	.90	.74	1.32	1.58	1.58	.80	.60	.78
12			.80	1.00	.90	.80	1.32	1.57	1.57	.79	.60	.75
13			.87	1.05	.91	.85	1.33	1.58	1.56	.77	.59	.75
14			.82	1.10	.92	.90	1.32	1.57	1.55	.76	.58	.75
15			.81	1.09	.92	.94	1.32	1.53	1.53	.76	.57	.75
16		0.62	.80	1.06	.91	.97	1.32	1.53	1.51	.75	.57	.72
17		.63	.80	1.05	.91	1.00	1.32	1.54	1.50	.76	.56	.72
18		.71	.80	1.02	.91	1.03	1.31	1.60	1.40	.76	.55	.72
19		.72	.80	1.00	.91	1.10	1.31	1.63	1.35	.77	.55	.71
20		.72	.81	.97	.90	1.15	1.31	1.55	1.35	.77	.55	.72
21		1.01	.75	.93	.90	1.26	1.30	1.59	1.34	.77	.55	.73
22		1.15	.76	.93	.92	1.33	1.33	1.60	1.36	.74	.55	.73
23		1.07	.78	.92	.93	1.40	1.42	1.59	1.27	.73	.55	.73
24		.61	.80	.91	.92	1.45	1.50	1.61	1.24	.74	.52	.73
25		.60	.86	.89	.91	1.41	1.70	1.62	1.21	.69	.52	.73
26		.85	.86	.90	.91	1.39	1.70	1.62	1.19	.65	.52	.72
27		.95	.86	.90	.91	1.29	1.68	1.61	1.17	.64	.52	.71
28		.95	.82	.91	.92	1.23	1.67	1.64	1.16	.63	.52	.70
29		.92	.80	.91		1.22	1.65	1.66	1.16	.61	.50	.65
30		.86	.81	.90		1.33	1.65	1.70	1.13	.62	.50	.65
31			.83	.93		1.48		1.75		.62	.50	.64

MANASTASH CREEK NEAR ELLENSBURG, WASH.

Location.—In sec. 15, T. 17 N., R. 17 E., at a private bridge on the ranch of A. L. Sackett, 2 miles below the North Fork and 8½ miles west of Ellensburg.

Records available.—April 5, 1909, to September 30, 1911.

Drainage area.—74 square miles.

Gage.—Vertical staff on left bank, 35 feet below the bridge.

Channel.—Rocks and gravel; practically permanent.

Discharge measurements.—Made from the bridge, or by wading near gage.

Winter flow.—Seriously affected by ice.

Regulation.—A storage reservoir of small capacity is operated at Manastash Lake.

Diversions.—Above all important diversions.

Accuracy.—Records good.

The following discharge measurement was made by F. B. Storey:

April 3, 1911: Gage height, 1.90 feet; discharge, 93.2 second-feet.

Daily gage height, in feet, of Manastash Creek near Ellensburg, Wash., for the year ending Sept. 30, 1911.

[A. L. Sackett, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.24	1.24	1.35	1.35	1.22	1.26	2.03	1.94	2.35	1.65	1.36	1.17
2	1.24	1.25	1.34	1.36	1.22	1.27	1.95	1.96	2.40	1.62	1.35	....
3	1.26	1.25	1.33	1.36	1.21	1.28	1.90	1.92	2.30	1.62	1.34	1.17
4	1.34	....	1.33	1.38	1.22	1.29	1.85	2.00	2.20	1.60	1.38	1.25
5	1.33	1.25	1.32	1.37	1.22	1.29	1.80	2.00	2.10	1.60	1.38	1.34
6	1.32	1.25	1.31	1.39	1.21	1.30	1.79	1.90	2.12	1.58	....	1.35
7	1.31	1.30	1.31	1.42	1.21	1.30	1.75	1.90	2.10	1.58	1.36	1.34
8	1.30	1.32	1.32	1.40	1.21	1.30	1.75	1.98	2.05	1.56	1.35	1.40
9	1.29	1.31	1.32	1.38	1.22	1.30	1.80	1.91	2.05	1.54	1.34	....
10	1.28	1.30	1.30	1.37	1.22	1.30	1.80	1.90	2.04	1.51	1.30	....
11	1.27	1.46	1.30	1.36	1.21	1.30	1.65	1.92	2.10	1.50	1.28	....
12	1.27	1.45	1.30	1.35	1.20	1.31	1.60	1.91	2.15	1.50	1.28	....
13	1.27	....	1.31	1.34	1.21	1.32	1.58	1.92	2.20	1.48	....	1.31
14	1.27	....	1.31	1.35	1.20	1.36	1.65	1.80	2.10	1.48	....	1.29
15	1.27	....	1.32	1.34	1.21	1.58	1.68	1.82	2.11	1.46	....	1.27
16	1.26	....	1.31	1.33	1.22	1.62	1.67	1.84	2.08	1.45	....	....
17	1.26	....	1.30	1.32	1.21	1.75	1.65	1.93	2.00	1.44	....	....
18	1.26	....	1.31	1.30	1.22	1.74	....	2.00	1.96	1.42	1.25	....
19	....	1.40	1.30	1.29	1.23	1.83	1.69	1.98	1.91	1.42	1.24	1.28
20	1.26	1.40	1.31	1.28	1.23	1.87	1.66	1.92	1.88	1.41	1.26	1.26
21	1.26	1.45	1.30	1.27	1.23	2.04	1.72	1.90	1.84	1.40	1.24	1.25
22	1.26	1.47	1.30	1.26	1.23	1.95	1.80	....	1.85	1.39	1.22	1.25
23	1.26	1.45	1.29	1.25	1.23	2.10	1.85	1.98	1.80	1.38	1.20	1.25
24	1.26	1.36	1.28	1.24	1.23	2.00	1.98	2.00	1.78	1.38	1.20	1.24
25	1.25	1.30	1.29	1.24	1.24	1.90	2.08	2.05	1.77	1.44	1.22	1.24
26	1.25	1.32	1.30	1.24	1.24	1.80	2.02	2.05	1.75	1.45	1.21	1.24
27	1.24	1.35	1.33	1.23	1.24	1.80	1.98	2.02	1.74	1.49	1.20	1.25
28	1.24	1.35	1.33	1.22	1.25	1.75	1.95	2.00	1.69	1.46	1.19	1.24
29	1.25	1.35	1.34	1.22	....	1.80	1.92	2.05	1.70	1.44	1.20	1.23
30	1.25	1.35	1.35	1.22	....	1.90	1.92	2.10	1.65	1.42	1.18	1.23
31	1.25	....	1.35	1.21	....	2.00	....	2.22	....	1.40	1.16	....

NOTE.—A little ice along the edge during December, 1910; gage readings probably not materially affected

Daily discharge, in second-feet, of Manastash Creek near Ellensburg, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	12	12	20	20	11	13	116	95	210	51	21	8
2	12	13	19	21	11	14	98	100	228	47	20	8
3	14	13	18	21	10	15	87	91	193	47	19	8
4	19	13	18	22	11	15	79	108	162	45	22	13
5	18	13	18	22	11	15	71	108	133	45	22	19
6	18	13	17	23	10	16	70	87	139	43	22	20
7	17	16	17	26	10	16	64	87	133	43	21	19
8	16	18	18	24	10	16	64	104	120	41	20	24
9	15	17	18	22	11	16	71	89	120	38	19	22
10	15	16	16	22	11	16	71	87	118	35	16	21
11	14	30	16	21	10	16	51	91	133	34	15	20
12	14	29	16	20	9	17	45	89	148	34	15	19
13	14	28	17	19	10	18	43	91	162	32	15	17
14	14	27	17	20	9	21	51	71	133	32	14	15
15	14	26	18	19	10	43	55	74	136	30	14	14
16	14	25	17	18	11	47	53	77	128	29	14	14
17	14	25	16	18	10	64	51	93	108	28	13	14
18	14	24	17	16	11	63	54	108	100	26	13	15
19	14	24	16	15	11	76	56	104	89	26	12	15
20	14	24	17	15	11	82	52	91	84	25	13	13
21	14	29	16	14	11	118	60	87	77	24	12	13
22	14	31	16	13	11	98	71	96	79	23	11	13
23	14	29	15	13	11	133	79	104	71	22	9	13
24	14	21	15	12	11	108	104	108	68	22	9	12
25	13	16	15	12	12	87	128	120	67	28	11	12
26	13	18	16	12	12	71	113	120	64	29	10	12
27	12	20	18	11	12	71	104	113	63	33	9	13
28	12	20	18	11	13	64	98	108	56	30	9	12
29	13	20	19	11	....	71	91	120	57	28	9	11
30	13	20	20	11	....	87	91	133	51	26	8	11
31	13	....	20	10	....	108	....	168	....	24	7	....

NOTE.—Discharge determined from a rating curve well defined below 300 second-feet. Discharge interpolated for days when no gage height was reported.

Monthly discharge of Manastash Creek near Ellensburg, Wash., for the year ending Sept. 30, 1911.

[Drainage area, 74 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	19	12	14.2	0.192	0.22	873	A.
November	31	12	21.0	.284	.32	1,250	B.
December	20	15	17.2	.232	.27	1,060	B.
January	26	10	17.2	.232	.27	1,060	A.
February	13	9.5	10.8	.146	.15	600	A.
March	133	13	52.1	.704	.81	3,200	A.
April	128	43	74.7	1.01	1.13	4,440	A.
May	168	71	101	1.36	1.57	6,210	A.
June	228	51	114	1.54	1.72	6,780	A.
July	51	22	32.9	.445	.51	2,020	A.
August	22	7.9	14.4	.195	.22	885	B.
September	24	8.3	14.7	.196	.22	875	B.
The year	228	7.9	40.4	.546	7.41	29,300	

WILSON CREEK AT THRALL, WASH.

Location.—In sec. 30, T. 17 N., R. 19 E., at a highway bridge just above Cherry Creek, half a mile east of Thrall and 5 miles southeast of Ellensburg.

Records available.—August 26 to October 15, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff at left end of highway bridge.

Channel.—Gravel; covered with growth of weeds.

Discharge measurements.—Made by wading.

Diversions.—Flow during period of record consisted of return water from irrigation in Kittitas Valley and water diverted from Yakima River. Natural flow all diverted above.

Estimates withheld for additional data.

Discharge measurements of Wilson Creek near Thrall, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Aug. 26[a]	F. B. Storey	5.10	109
Sept. 12	R. K. Ray	5.33	165

[a] Affected by weeds.

Daily gage height, in feet, of Wilson Creek near Thrall, Wash., for the year ending Sept. 30, 1911.

[Mrs. J. O. Noggle, observer.]

Day.	Aug.	Sept.	Oct.	Day.	Aug.	Sept.	Oct.	Day.	Aug.	Sept.	Oct.
1		5.10	4.85	11		5.35	5.25	21		5.20	
2		5.20	5.25	12		5.35	5.20	22		5.20	
3		5.10	5.30	13		5.35	5.20	23		5.15	
4		5.20	5.30	14		5.35	5.20	24		5.15	
5		5.60	5.30	15		5.35	5.20	25		5.15	
6		5.70	5.25	16		5.40		26	5.05	5.00	
7		5.60	5.20	17		5.40		27	5.12	4.90	
8		5.45	5.25	18		5.40		28	5.15	4.85	
9		5.50	5.25	19		5.40		29	5.30	4.90	
10		5.40	5.25	20		5.30		30	5.05	4.90	
								31	5.20		

NOTE.—Gage heights Aug. 26 to Sept. 10, probably slightly affected by weeds.

WENAS CREEK NEAR SELAH, WASH.

Location.—In the SE. ¼ sec. 18, T. 19 N., R. 14 E., half a mile above the mouth of the creek and 3½ miles north of Selah.

Records available.—March 30, 1909, to September 30, 1911.

Drainage area.—177 square miles.

Gage.—Vertical staff on left bank, 200 feet below ford.

Channel.—Mud, sand, and gravel; shifting.

Discharge measurements.—Made by wading or from foot plank 300 feet above gage.

Winter flow.—Not seriously affected by ice.

Diversions.—Below all diversions and return waters.

Estimates withheld for additional data.

Discharge measurements of Wenas Creek near Selah, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
1910.				1911.			
Oct. 18	F. B. Storey	0.78	4.5	May 27	F. B. Storey	0.78	8.0
Nov. 15	.....do	.81	6.2	Aug. 9	.....do	.64	2.5

Daily gage height, in feet, of Wenas Creek near Selah, Wash., for the year ending Sept. 30, 1911.

[Walter Hustead, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.9	0.8	0.9	0.9	1.0	0.8	1.0	0.7	0.6	0.7	0.6	0.6
2	.8	.8	.9	.9	1.0	.8	1.0	.7	.6	.7	.6	.6
3	.8	.8	.9	.9	.8	.8	1.0	.7	.6	.7	.6	.8
4	.9	.8	.9	.9	.8	.8	1.0	.7	.6	.7	.6	.9
5	1.1	.8	.9	.9	.8	1.0	1.0	.7	.6	.7	.6	.9
6	1.1	.8	.9	.9	.8	1.0	1.0	.7	.6	.7	.6	.9
7	1.1	.8	.9	.9	.8	1.0	1.0	.7	.6	.7	.6	.9
8	1.1	.8	.9	.9	.8	1.0	1.0	.7	.6	.7	.6	.9
9	1.1	.8	.9	.9	.8	1.0	1.0	.6	.6	.7	.6	.9
10	1.1	.8	.9	.9	.8	1.0	.9	.6	.6	.7	.6	.7
11	1.1	.8	.9	.9	.8	1.0	.9	6.	.6	.7	.6	.7
12	1.1	.8	.9	.9	.8	1.0	.9	.6	.6	.7	.6	.7
13	1.1	.8	.9	.9	.8	1.0	.9	.6	.6	.7	.6	.7
14	1.1	.8	.9	.9	.8	1.0	.9	.6	.6	.7	.6	.7
15	1.1	.8	.9	.9	.8	1.0	.9	.6	.6	.7	.6	.7
16	1.1	.8	.9	.9	.8	1.0	.9	.6	.6	.7	.6	.7
17	1.1	.8	.9	.9	.8	1.1	.9	.6	.6	.7	.6	.7
18	1.1	.8	.9	.9	8	1.1	.9	.6	.6	.7	.6	.7
19	1.1	.8	.9	.9	.8	1.2	.9	.6	.6	.7	.6	.7
20	1.1	.8	.9	.9	.8	1.7	.9	.6	.7	.7	.6	.7
21	1.1	.8	.9	.9	.8	1.7	.9	.6	.7	.7	.6	.7
22	1.1	.8	.9	.9	.8	1.8	.9	.7	.7	.7	.6	.7
23	1.2	.8	.9	.9	.8	1.8	.8	.8	.7	.4	.6	.7
24	1.2	.8	.9	.9	.8	1.8	.7	.8	.7	.4	.6	.7
25	1.2	.8	.9	.9	.8	1.8	.7	.8	.7	.4	.6	.7
26	1.2	.8	.9	.9	....	1.8	.7	.8	.7	.6	.6	.7
27	1.2	.9	.9	.9	....	1.5	.7	.9	.7	.6	.7	.7
28	1.2	.9	.9	.9	....	1.3	.7	.9	.7	.6	.7	.7
29	1.2	.9	.9	.9	....	1.2	.7	.9	.7	.6	.7	.7
30	1.2	.9	.9	.9	....	1.0	.7	.9	.7	.6	.7	.7
31	1.2	....	.9	.8	....	1.0	....	.9	....	.6	.7	....

NOTE.—Observer notes ice in creek Dec. 23, 1910, to Jan. 25, 1911; gage heights probably not seriously affected. Gage height record not considered reliable.

NACHES RIVER AT ANDERSON'S RANCH, NEAR NILE, WASH.

Location.—In sec. 35, T. 17 N., R. 14 E., half a mile below Lost Creek, 1 mile below Gold Creek, 7 miles below Bumping River, 9 miles above Rattlesnake Creek, 10 miles above Nile, and 24 miles above Naches.

Records available.—April 24, 1909, to September 30, 1911.

Drainage area.—391 square miles.

Gage.—Vertical staff on left bank.

Channel.—Gravel and cobblestones; shifting in floods.

Discharge measurements.—Made from cable 500 feet above gage and by wading near gage.

Winter flow.—Seriously affected by ice; then estimated by comparison with records at adjacent stations.

Regulation.—Flow partly regulated by storage in Bumping Lake since November, 1910. Records corrected.

Diversions.—Above all important diversions. A small quantity diverted above station by Anderson ditch.

Accuracy.—Results good.

Discharge measurements of Naches River at Anderson's ranch, near Nile, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 24	F. B. Storey	1.28	342	May 19	Howard Kimble	2.75	2,060
25	.....do	1.30	344	Aug. 16	R. K. Ray	1.77	835
				30	F. B. Storey	1.72	638
1911.				Sept. 14	.....do	1.24	303
Apr. 20	.....do	1.98	933				

Daily gage height, in feet, of Naches River at Anderson's ranch, near Nile, Wash., for the year ending Sept. 30, 1911.

[J. W. Anderson, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	1.2	2.1	1.4	1.4	1.05	2.4	2.7	3.4	2.1	1.2	1.7
2	1.1	1.2	2.0	1.4	1.35	1.1	2.3	2.8	3.5	2.1	1.2	1.7
3	1.3	1.2	2.1	1.4	1.35	1.15	2.3	2.8	3.2	2.15	1.2	1.7
4	1.7	1.2	2.0	1.4	1.4	1.1	2.15	2.9	3.0	2.0	1.2	1.7
5	1.5	1.2	2.1	1.4	1.35	1.1	2.1	2.95	2.95	2.0	1.2	1.7
6	1.55	1.25	2.0	1.4	1.3	1.1	2.1	2.9	2.85	2.0	1.3	1.1
7	1.55	1.5	2.0	1.55	1.3	1.1	2.0	2.8	2.9	2.0	1.25	1.05
8	1.55	1.7	1.8	1.55	1.25	1.1	2.0	2.85	2.85	2.05	1.65	1.05
9	1.5	1.6	1.8	1.55	1.2	1.1	2.05	2.85	2.65	2.05	1.7	1.1
10	1.45	2.0	1.8	1.5	1.2	1.1	2.1	2.7	2.95	2.05	1.7	1.2
11	1.4	3.0	1.8	1.5	1.2	1.1	2.1	2.6	2.95	2.0	1.7	1.05
12	1.4	2.2	1.7	1.45	1.15	1.1	2.0	2.6	3.2	2.0	1.7	1.05
13	1.4	2.1	1.7	1.4	1.15	1.1	1.9	2.6	3.2	2.0	1.7	1.3
14	1.4	2.0	1.7	1.35	1.1	1.2	1.9	2.5	3.25	2.0	1.7	1.25
15	1.4	2.2	1.65	1.3	1.05	1.35	1.9	2.45	3.0	1.95	1.7	1.25
16	1.4	2.1	1.65	1.3	1.0	1.5	1.9	2.6	3.0	1.95	1.7	1.3
17	1.4	2.2	1.6	1.4	1.1	1.6	1.95	2.8	2.95	1.95	1.8	1.35
18	1.4	2.0	1.4	1.6	1.1	1.7	2.0	2.9	2.75	1.85	1.8	1.35
19	1.4	2.0	1.4	1.65	1.1	1.7	2.05	2.9	2.6	1.8	1.8	1.45
20	1.4	1.9	1.4	1.6	1.05	1.8	2.0	2.8	2.4	1.75	1.8	1.5
21	1.4	3.6	1.4	1.6	1.1	1.95	2.1	2.7	2.4	1.65	1.8	1.5
22	1.4	3.0	1.4	1.55	1.15	2.0	2.25	2.8	2.45	1.6	1.8	1.8
23	1.35	2.8	1.4	1.5	1.15	2.15	2.4	2.75	2.4	1.55	1.8	1.8
24	1.3	2.2	1.4	1.5	1.1	2.15	2.5	2.8	2.3	1.5	1.8	1.75
25	1.3	2.0	1.4	1.5	1.1	2.05	2.9	2.75	2.2	1.6	1.75	1.7
26	1.25	2.0	1.4	1.45	1.1	1.95	2.9	2.7	2.3	1.55	1.75	1.7
27	1.25	2.3	1.4	1.45	1.1	1.9	2.8	2.65	2.4	1.5	1.75	1.7
28	1.25	2.4	1.4	1.4	1.05	1.8	2.7	2.6	2.35	1.45	1.75	1.65
29	1.25	2.2	1.4	1.3	....	1.9	2.6	2.65	2.25	1.2	1.7	1.6
30	1.25	2.1	1.4	1.4	....	2.0	2.6	2.8	2.15	1.2	1.75	1.5
31	1.25	....	1.4	1.4	....	2.2	....	3.0	....	1.2	1.7	....

Daily discharge, in second-feet, of Naches River at Anderson's ranch, near Nile, Wash., for the year ending Sept. 30, 1912.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	190	275	1,140	415	415	192	1,560	2,060	3,750	1,120	280	660
2	215	275	1,020	415	380	220	1,410	2,260	4,020	1,120	280	660
3	345	275	1,140	415	380	250	1,410	2,260	3,230	1,190	280	660
4	700	275	1,020	415	415	220	1,190	2,480	2,720	990	280	660
5	515	275	1,140	415	380	220	1,120	2,600	2,600	990	280	660
6	560	310	1,020	415	345	220	1,120	2,480	2,370	990	345	220
7	560	515	1,020	530	345	220	990	2,260	2,480	990	312	192
8	560	700	800	530	312	220	990	2,370	2,370	1,060	615	192
9	515	605	800	530	280	220	1,060	2,370	1,970	1,060	660	220
10	470	1,020	800	490	280	220	1,120	2,060	2,600	1,060	660	280
11	425	2,810	800	490	280	220	1,120	1,880	2,600	990	660	192
12	425	1,270	700	452	250	220	990	1,880	3,230	990	660	192
13	425	1,140	700	415	250	220	870	1,880	3,230	990	660	345
14	425	1,020	700	380	220	280	870	1,720	3,360	990	660	312
15	425	1,270	652	345	192	380	870	1,640	2,720	930	660	312
16	425	1,140	652	345	165	490	870	1,880	2,720	930	660	345
17	425	1,270	605	415	220	570	930	2,260	2,600	930	760	380
18	425	1,020	425	570	220	660	990	2,480	2,160	815	760	380
19	425	1,020	425	615	220	660	1,060	2,480	1,880	760	760	452
20	425	910	425	570	192	760	990	2,260	1,560	710	760	490
21	425	4,350	425	570	220	930	1,120	2,060	1,560	615	760	490
22	425	2,810	425	530	250	990	1,340	2,260	1,640	570	760	760
23	385	2,330	425	490	250	1,190	1,560	2,160	1,560	530	760	760
24	345	1,270	425	490	220	1,190	1,720	2,260	1,410	490	760	710
25	345	1,020	425	490	220	1,060	2,480	2,160	1,260	570	710	660
26	310	1,020	425	452	220	930	2,480	2,060	1,410	530	710	660
27	310	1,410	425	452	220	870	2,260	1,970	1,560	490	710	660
28	310	1,550	425	415	192	760	2,060	1,880	1,480	452	710	615
29	310	1,270	425	345	....	870	1,880	1,970	1,340	280	660	570
30	310	1,140	425	415	....	990	1,880	2,260	1,190	280	710	490
31	310	....	425	415	....	1,260	....	2,720	....	280	660	....

NOTE.—Discharge determined from two rating curves, both well defined below 4,000 second-feet.

Monthly discharge of Naches River at Anderson's ranch, near Nile, Wash., for the year ending Sept. 30, 1911.

[Drainage area 391 square miles.]

Month.	Observed discharge (second-feet).			Run-off (total in acre-feet).			Discharge without storage (second-feet).		Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Observed.	Stored.	Without storage.	Mean.	Per square mile.		
October	700	190	409	25,100	0	25,100	409	1.05	1.21	A.
November	4,350	275	1,190	70,800	+ 3,000	73,800	1,240	3.17	3.54	A.
December	1,140	425	666	41,000	− 3,800	37,200	605	1.55	1.79	B.
January	615	345	459	28,200	+ 18	28,200	459	1.17	1.35	B.
February	415	165	269	14,900	− 10	14,900	268	.685	.71	A.
March	1,260	192	571	35,100	+ 196	35,300	574	1.47	1.70	A.
April	2,480	870	1,340	79,700	+ 1,260	81,000	1,360	3.48	3.88	A.
May	2,720	1,640	2,170	133,000	+ 1,940	135,000	2,200	5.63	6.49	A.
June	4,020	1,190	2,290	136,000	+24,100	160,000	2,690	6.88	7.68	B.
July	1,190	280	797	49,000	+ 3,780	52,800	859	2.20	2.54	A.
August	760	280	610	37,500	−19,100	18,400	299	.765	.88	B.
September	760	192	473	28,100	−10,300	17,800	299	.765	.85	A.
The year	4,350	165	938	678,000	+ 1,080	680,000	938	2.40	32.62	

NACHES RIVER AT OAK FLAT, NEAR NILE, WASH.

Location.—In sec. 34, T. 15 N., R. 16 E., just above Oak Flat, half a mile above intake of Selah Valley canal, 2 miles above Tieton River, 7 miles northwest of Naches, 7 miles southeast of Nile, and 9 miles below Rattlesnake Creek.

Records available.—June 25, 1904, to September 30, 1911.

Drainage area.—636 square miles.

Gage.—Barrett and Lawrence automatic gage since September 20, 1911, referred to standard chain gage installed April 13, 1909. Prior to this date an inclined staff 800 feet below present location.

Channel.—Gravel and small cobblestones; shifting in floods.

Discharge measurements.—Made from cable 50 feet below gage and by wading near gage.

Winter flow.—Not seriously affected by ice.

Regulation.—Flow partly regulated by storage in Bumping Lake. Results corrected.

Diversions.—Above all important diversions.

Accuracy.—Results good.

Discharge measurements of Naches River at Oak Flat, near Nile, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 10	F. B. Storey	4.44	676	Apr. 21	F. B. Storey	5.21	1,280
1911.				Aug. 16	R. K. Ray	4.53	789
Mar. 22	Howard Kimble	5.18	1,220	Sept. 14	F. B. Storey	3.96	378

Daily gage height, in feet, of Naches River at Oak Flat, near Nile, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	3.4	3.8	5.2	4.1	3.9	3.5	5.7	5.9	7.0	5.3	3.9	4.4
2	3.5	3.8	5.1	4.1	3.8	3.5	5.8	6.0	7.2	......	3.9	4.45
3	3.8	3.8	5.1	4.2	3.8	3.6	5.6	6.1	6.9	5.3	3.9	......
4	4.7	3.9	5.0	4.2	3.8	3.6	5.5	6.2	......	5.12	3.9	4.45
5	4.5	3.9	4.9	4.1	3.9	3.7	5.4	6.3	6.8	5.1	3.9	4.6
6	4.4	3.9	4.9	4.1	3.9	3.7	5.3	6.3	6.8	5.1	......	3.9
7	4.5	3.9	4.9	4.3	3.8	3.8	5.2	6.2	6.3	5.1	3.9	3.7
8	4.6	4.6	4.8	4.3	3.8	3.8	5.1	6.2	6.3	5.2	4.4	3.6
9	4.5	4.7	4.8	4.3	3.8	3.7	5.2	6.2	6.1	......	4.5	3.8
10	4.5	4.7	4.7	4.3	3.8	3.7	5.3	6.0	6.8	5.1	4.4	......
11	4.3	6.2	4.6	4.2	3.8	3.7	5.3	5.9	......	5.0	4.5	3.8
12	4.2	5.6	4.6	4.1	3.8	3.7	5.2	......	6.9	5.0	4.5	3.89
13	4.2	5.5	4.6	3.9	3.8	3.7	5.0	......	7.0	4.9	......	4.0
14	4.1	5.3	4.5	3.9	3.8	3.8	4.9	......	7.0	4.9	4.4	4.0
15	4.2	5.1	4.5	4.0	3.8	4.0	4.9	......	6.7	4.9	4.5	4.0
16	4.1	5.0	4.5	4.1	3.7	4.2	5.0	......	6.5	......	4.5	4.1
17	4.1	5.0	4.4	4.2	3.7	4.4	5.0	6.1	6.4	4.9	4.6	4.1
18	4.3	5.0	4.4.	4.1	3.7	4.5	5.0	6.2	......	4.89	4.6	4.0
19	4.3	4.9	4.4	4.1	3.7	4.7	5.0	6.2	6.0	4.78	4.6	4.1
20	4.2	4.9	4.3	4.1	3.6	4.8	5.1	6.1	5.8	4.67	......	4.2
21	4.1	6.4	4.3	4.1	3.6	4.9	5.2	......	5.8	4.56	4.6	4.0
22	4.1	6.3	4.3	3.9	3.7	5.2	5.4	6.2	5.8	4.5	4.6	4.4
23	4.0	6.1	4.3	3.9	3.7	5.4	5.5	6.1	5.7	......	4.5	4.64
24	4.0	5.9	4.3	4.0	3.7	5.5	5.9	6.2	5.6	4.3	4.5	4.6
25	4.0	5.7	4.4	4.0	3.7	5.4	6.3	6.1	......	4.4	4.5	4.6
26	4.0	5.6	4.4	4.0	3.7	5.2	6.2	6.0	5.45	4.4	4.5	4.6
27	3.9	5.4	4.3	3.9	3.6	5.1	6.0	6.0	5.7	4.3	......	4.5
28	3.9	5.4	4.2	3.9	3.5	4.9	6.0	......	5.55	4.2	4.5	4.4
29	3.9	5.3	4.2	3.9	......	5.0	5.9	6.0	5.45	4.0	4.5	4.4
30	3.9	5.3	4.2	3.9	......	5.2	5.9	6.1	5.34	......	4.5	4.4
31	3.8	......	4.2	3.9	......	5.5	......	6.5	......	3.9	4.5	......

Daily discharge, in second-feet, of Naches River at Oak Flat, near Nile, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	244	363	1,340	412	325	190	1,890	2,200	4,560	1,370	325	575
2	268	363	1,230	412	287	190	2,040	2,370	5,090	1,370	325	608
3	363	363	1,230	461	287	220	1,750	2,550	4,300	1,370	325	608
4	864	400	1,130	461	287	220	1,620	2,740	4,180	1,160	325	608
5	719	400	1,030	412	325	252	1,490	2,940	4,050	1,140	325	710
6	654	400	1,030	412	325	252	1,370	2,940	4,050	1,140	325	325
7	719	400	1,030	515	287	287	1,250	2,740	2,940	1,140	325	252
8	789	789	944	515	287	287	1,140	2,740	2,940	1,250	575	220
9	719	864	944	515	287	252	1,250	2,740	2,550	1,200	640	287
10	719	864	864	515	287	252	1,370	2,370	4,050	1,140	575	287
11	594	2,820	789	461	287	252	1,370	2,200	4,180	1,040	640	287
12	540	1,840	789	412	287	252	1,250	2,260	4,300	1,040	640	321
13	540	1,700	789	325	287	252	1,040	2,320	4,560	950	608	367
14	490	1,460	719	325	287	287	950	2,370	4,560	950	575	367
15	540	1,230	719	367	287	367	950	2,430	3,810	950	640	367
16	490	1,130	719	412	252	461	1,040	2,490	3,360	950	640	412
17	490	1,130	654	461	252	575	1,040	2,550	3,150	950	710	412
18	594	1,130	654	412	252	640	1,040	2,740	2,760	942	710	367
19	594	1,030	654	412	252	785	1,040	2,740	2,370	849	710	412
20	540	1,030	594	412	220	865	1,140	2,550	2,040	762	710	461
21	490	3,210	594	412	220	950	1,250	2,640	2,040	682	710	367
22	490	3,010	594	325	252	1,250	1,490	2,740	2,040	640	710	575
23	443	2,640	594	325	252	1,490	1,620	2,550	1,890	578	640	740
24	443	2,290	594	367	252	1,620	2,200	2,740	1,750	515	640	710
25	443	1,980	654	367	252	1,490	2,940	2,550	1,660	575	640	710
26	443	1,840	654	367	252	1,250	2,740	2,370	1,560	575	640	710
27	400	1,580	594	325	220	1,140	2,370	2,370	1,890	515	640	640
28	400	1,580	540	325	190	950	2,370	2,370	1,680	461	640	575
29	400	1,460	540	325	....	1,040	2,200	2,370	1,560	367	640	575
30	400	1,460	540	325	....	1,250	2,200	2,550	1,420	346	640	575
31	363	....	540	325	....	1,620	....	3,360	....	325	640	....

NOTE.—Discharge determined from two well-defined rating curves. Discharge interpolated for days when no gage height was reported.

Monthly discharge of Naches River at Oak Flat, near Nile, Wash., for the year ending Sept. 30, 1911.

[Drainage area, 636 square miles.]

Month.	Observed discharge (second-feet).			Run-off (total in acre-feet).			Discharge without storage (second-feet).		Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Observed.	Stored.	Without storage.	Mean.	Per square mile.		
October	864	244	522	32,100	0	32,100	522	0.821	0.95	B.
November	3,210	363	1,360	80,900	+ 3,000	83,900	1,410	2.22	2.48	A.
December	1,340	540	784	48,200	− 3,800	44,400	722	1.14	1.31	A.
January	515	325	401	24,700	+ 18	24,700	401	.631	.73	A.
February	325	190	269	14,900	− 10	14,900	269	.423	.44	A.
March	1,620	190	683	42,000	+ 196	42,200	686	1.08	1.24	A.
April	2,940	950	1,580	94,000	+ 1,260	95,300	1,600	2.52	2.81	A.
May	3,360	2,200	2,570	158,000	+ 1,940	160,000	2,600	4.09	4.72	A.
June	5,090	1,420	3,040	181,000	+24,100	205,000	3,450	5.42	6.05	A.
July	1,370	325	879	54,000	+ 3,780	57,800	940	1.48	1.71	A.
August	710	325	575	35,400	−19,100	16,300	265	.417	.48	A.
September	740	220	481	28,600	−10,300	18,300	308	.484	.54	A.
The year	5,090	190	1,100	794,000	+ 1,080	795,000	1,100	1.73	23.46	

NACHES RIVER BELOW TIETON RIVER, NEAR NACHES, WASH.

Location.—In sec. 35, T. 15 N., R. 16 E., about 600 feet below Tieton River, 500 feet above Wapatox power canal intake, and 5 miles northwest of Naches.

Records available.—August 4 to October 28, 1905; March 16, 1909, to September 30, 1911.

Drainage area.—930 square miles.

Gage.—Staff in two sections; lower section inclined, upper vertical.

Channel.—Gravel and large cobblestones; shifting in floods.

Discharge measurements.—Made from cable at gage.

Winter flow.—Not seriously affected by ice.

Regulation.—Flow partly regulated by storage in Bumping Lake.

Diversions.—Above all important diversions except Selah Valley and Tieton canals.

Accuracy.—Results fair.

Discharge measurements of Naches River below Tieton River, near Naches, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Dis-charge.	Date.	Hydrographer.	Gage height.	Dis-charge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 24	F. B. Storey	2.25	598	Apr. 15	F. B. Storey	3.22	1,280
Nov. 23	Howard Kimble	4.75	3,390	20	do	3.38	1,500
28	F. B. Storey	3.72	2,000	Aug. 17	R. K. Ray	2.80	835
				Sept. 14	F. B. Storey	2.31	561
1911.							
Mar. 22	Howard Kimble	3.65	1,670				

Daily gage height, in feet, of Naches River below Tieton River, near Naches, Wash., for the year ending Sept. 30, 1911.

[W. H. Johnson, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.0	2.3	4.0	2.6	2.2	2.0	3.9	4.3	5.9	3.7	2.2	2.8
2	2.2	2.3	3.8	2.5	2.2	2.0	3.8	4.4	6.0	3.7	2.2	2.9
3	2.8	2.3	3.6	2.5	2.1	2.0	3.8	4.6	5.6	3.7	2.3	3.3
4	3.6	2.3	3.5	2.5	2.1	2.0	3.7	4.7	5.2	3.6	2.4	2.9
5	3.2	2.3	3.4	2.6	2.1	2.1	3.6	4.9	5.0	3.6	2.3	2.5
6	3.2	2.2	3.4	2.6	2.1	2.1	3.6	4.9	4.9	3.6	2.5	2.0
7	3.3	2.3	3.3	2.8	2.1	2.0	3.5	4.8	4.8	3.6	2.3	2.2
8	3.4	3.2	3.3	2.8	2.2	2.0	3.6	4.8	....	3.6	2.7	2.2
9	3.0	3.3	3.2	2.8	2.2	2.1	3.7	4.7	....	3.5	2.7	2.3
10	2.8	3.3	3.2	2.7	2.2	2.1	3.6	4.5	....	3.4	2.2	2.2
11	2.7	5.5	3.1	2.6	2.2	2.1	3.5	4.4	....	3.3	2.9	2.2
12	2.7	5.0	3.1	2.5	2.2	2.1	3.4	4.3	5.9	3.3	2.8	2.4
13	2.6	4.6	3.0	2.3	2.1	2.1	3.3	....	6.2	3.2	2.5	2.3
14	2.5	4.1	3.0	2.3	2.1	2.3	3.3	....	....	3.3	2.5	2.3
15	2.5	3.7	3.0	2.3	2.1	2.5	3.3	....	5.4	3.3	2.7	2.3
16	2.4	3.6	2.9	2.3	2.1	2.7	3.3	....	5.3	3.3	2.7	2.4
17	2.4	3.5	2.9	2.4	2.1	2.8	3.4	4.5	5.1	3.3	2.9	2.4
18	2.5	3.4	2.8	2.4	2.1	2.9	3.4	4.7	4.8	3.1	3.0	2.5
19	2.6	3.3	2.8	2.4	2.1	3.1	3.4	4.6	4.5	3.0	3.1	2.4
20	2.6	3.3	2.8	2.5	2.0	3.3	3.5	4.5	4.3	2.9	3.3	2.6
21	2.5	5.6	2.7	2.5	2.0	3.4	3.6	4.4	4.3	2.8	2.8	2.6
22	2.5	5.5	2.7	2.4	2.0	3.7	3.7	4.6	4.3	2.7	2.8	2.9
23	2.4	5.3	2.7	2.4	2.0	3.9	4.0	4.5	4.2	2.6	2.9	2.8
24	2.5	5.2	2.6	2.4	2.1	4.0	4.4	4.7	4.0	2.5	2.8	2.8
25	2.6	5.1	2.6	2.4	2.1	3.9	4.4	4.5	4.0	2.6	2.8	2.7
26	2.6	5.0	2.7	2.3	2.1	3.7	4.5	4.4	4.1	2.7	2.8	2.6
27	2.5	4.8	2.7	2.3	2.1	3.6	4.5	4.4	4.2	2.6	2.8	2.7
28	2.4	4.5	2.7	2.3	2.1	3.4	4.4	4.4	4.2	2.5	2.8	2.4
29	2.4	4.3	2.7	2.3	....	3.5	4.3	4.5	3.9	2.3	2.9	2.5
30	2.4	4.2	2.6	2.3	....	3.7	4.3	4.8	3.7	2.3	2.7	2.5
31	2.3	....	2.6	2.3	....	4.0	....	5.3	....	2.3	2.8	....

Daily discharge, in second-feet, of Naches River below Tieton River, near Naches, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	465	620	2,420	725	495	410	2,110	2,740	6,610	1,830	495	870
2	565	620	2,100	660	495	410	1,970	2,920	6,900	1,830	495	950
3	970	620	1,830	660	450	410	1,970	3,310	5,750	1,830	545	1,350
4	1,830	620	1,700	660	450	410	1,830	3,520	4,690	1,700	600	950
5	1,340	620	1,570	725	450	450	1,700	3,970	4,200	1,700	545	660
6	1,340	565	1,570	725	450	450	1,700	3,970	3,970	1,700	660	410
7	1,450	620	1,450	870	450	410	1,580	3,740	3,740	1,700	545	495
8	1,570	1,340	1,450	870	495	410	1,700	3,740	4,310	1,700	795	495
9	1,140	1,450	1,340	870	495	450	1,830	3,520	4,890	1,580	795	545
10	970	1,450	1,340	795	495	450	1,700	3,110	5,460	1,460	495	495
11	890	5,730	1,240	725	495	450	1,580	2,920	6,040	1,350	950	495
12	890	4,470	1,240	660	495	450	1,460	2,740	6,610	1,350	870	600
13	815	3,530	1,140	545	450	450	1,350	2,810	7,500	1,240	660	545
14	740	2,580	1,140	545	450	545	1,350	2,890	6,350	1,350	660	545
15	740	1,960	1,140	545	450	660	1,350	2,960	5,200	1,350	795	545
16	680	1,830	1,060	545	450	795	1,350	3,040	4,940	1,350	795	600
17	680	1,700	1,060	600	450	870	1,460	3,110	4,440	1,350	950	600
18	740	1,570	970	600	450	950	1,460	3,520	3,740	1,140	1,040	660
19	815	1,450	970	600	450	1,140	1,460	3,310	3,110	1,040	1,140	600
20	815	1,450	970	660	410	1,350	1,580	3,110	2,740	950	1,350	725
21	740	6,000	890	660	410	1,460	1,700	2,920	2,740	870	870	725
22	740	5,730	890	600	410	1,830	1,830	3,310	2,740	795	870	950
23	680	5,200	890	600	410	2,110	2,260	3,110	2,570	725	950	870
24	740	4,950	815	600	450	2,260	2,920	3,520	2,260	660	870	870
25	815	4,710	815	600	450	2,110	2,920	3,110	2,260	725	870	795
26	815	4,470	890	545	450	1,830	3,110	2,920	2,410	795	870	725
27	740	3,990	890	545	450	1,700	3,110	2,920	2,570	725	870	795
28	680	3,330	890	545	450	1,460	2,920	2,920	2,570	660	870	600
29	680	2,930	890	545	....	1,580	2,740	3,110	2,110	545	950	660
30	680	2,750	815	545	....	1,830	2,740	3,740	1,830	545	795	660
31	620	....	815	545	....	2,260	....	4,940	....	545	870	......

NOTE.—Discharge determined from two well-defined rating curves. Discharge interpolated for days when no gage height was reported.

Monthly discharge of Naches River below Tieton River, near Naches, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	1,830	465	883	54,300	B.
November	6,000	565	2,630	156,000	B.
December	2,420	815	1,200	73,800	B.
January	870	545	642	39,500	B.
February	495	410	456	25,300	B.
March	2,260	410	1,040	64,000	B.
April	3,110	1,350	1,960	117,000	B.
May	4,940	2,740	3,270	201,000	B.
June	7,500	1,830	4,180	249,000	B.
July	1,830	545	1,200	73,800	B.
August	1,350	495	801	49,300	B.
September	1,350	410	693	41.200	B.
The year	6,000	410	1,580	1,140,000	

SELAH VALLEY CANAL NEAR NACHES, WASH.

Location.—In sec. 35, T. 15 N., R. 16 E., 800 feet below the head gate, about 1 mile above the mouth of Tieton River, and about 8 miles northwest of Naches.

Records available.—1904 to 1906, 1909 to 1911; irrigation season only.

Gage.—Vertical staff.

Channel.—Gravel; practically permanent.

Discharge measurements.—Made from a footbridge near the gage.

Accuracy.—Results good.

Discharge measurements of Selah Valley canal near Naches, Wash., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 15	F. B. Storey	1.20	48.2	Aug. 28	A. C. Libby	2.62	130
May 6	do	2.39	120	Sept. 7	R. K. Ray	2.20	89.8
June 30	Howard Kimble	2.38	114	14	F. B. Storey	2.40	103

Daily gage height, in feet, of Selah Valley canal near Naches, Wash., for 1911.

[Gordon Girdner, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1		2.2	2.3	2.3	2.6	2.6	2.2
2		2.2	2.2	2.4	2.6	2.6	2.0
3		2.3	2.2	2.4	2.6	2.7	1.8
4	1.0	2.3	2.1	2.4	2.6	2.7	1.9
5	1.3	2.4	2.1	2.4	2.6	2.3	1.9
6	1.2	2.4	2.1	2.5	2.6	2.3	2.0
7	1.2	2.4	2.1	2.5	2.6	2.3	2.0
8	1.2	2.4	2.1	2.5	2.6	2.3	2.0
9	1.2	2.4	2.1	2.6	2.6	2.3	2.0
10	1.2	2.4	2.2	2.6	2.6	2.3	2.0
11	1.2	2.3	2.2	2.6	2.6	2.3	2.0
12	1.3	2.3	2.2	2.6	2.6	2.4	2.0
13	1.3		2.3	2.6	2.6	2.4	2.0
14	1.3		2.3	2.6	2.6	2.4	1.9
15	1.3		2.3	2.6	2.6	2.4	1.9
16	1.3		2.3	2.6	2.6	2.4	
17	1.3		2.3	2.6	2.6	2.4	
18	1.3		2.3	2.6	2.7	2.4	1.0
19	1.3		2.3	2.6	2.7	2.4	1.0
20	1.3	2.3	2.3	2.4	2.6	2.2	1.0
21	1.3	2.1	2.4	2.4	2.7	2.2	1.0
22	1.3	2.1	2.4	2.5	2.7	2.2	.7
23	2.0	2.1	2.4	2.5	2.7	2.2	.7
24	2.0	2.1	2.3	2.6	2.7	2.2	.7
25	2.2	2.2	2.4	2.6	2.7	2.2	.7
26	2.2	2.2	2.4	2.6	2.7	2.2	.7
27	2.1	2.2	2.4	2.6	2.7	2.2	.7
28	2.1	2.1	2.4	2.6	2.6	2.2	.7
29	2.1	2.1	2.4	2.5	2.6	2.2	.7
30	2.1	2.2	2.4	2.6	2.6	2.2	.7
31		2.2		2.6	2.6		.7

Daily discharge, in second-feet, of Selah Valley canal near Naches, Wash., for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	0	106	112	112	131	131	90
2	0	106	106	118	131	131	78
3	0	112	106	118	131	138	66
4	39	112	100	118	131	138	72
5	54	118	100	118	131	96	72
6	49	118	100	124	131	96	78
7	49	118	100	124	131	96	78
8	49	118	100	124	131	96	78
9	49	118	100	131	131	96	78
10	49	118	106	131	131	96	78
11	49	112	106	131	131	96	78
12	54	112	106	131	131	103	78
13	54	112	112	131	131	103	78
14	54	112	112	131	131	103	72
15	54	112	112	131	131	103	72
16	54	112	112	131	131	103	0
17	54	112	112	131	131	103	0
18	54	112	112	131	138	103	28
19	54	112	112	131	138	103	28
20	54	112	112	118	131	90	28
21	54	100	118	118	138	90	28
22	54	100	118	124	138	90	18
23	94	100	118	124	138	90	18
24	94	100	112	131	138	90	18
25	106	106	118	131	138	90	18
26	106	106	118	131	138	90	18
27	100	106	118	131	138	90	18
28	100	100	118	131	131	90	18
29	100	100	118	124	131	90	18
30	100	106	118	131	131	90	18
31	....	106	....	131	131	....	18

NOTE.—Discharge Apr. 1 to Sept. 4 determined from a well-defined rating curve. Discharge Sept. 5 to Oct. 31 determined from a rating curve well defined above 70 second-feet. Discharge May 13 to 19 interpolated.

Monthly discharge of Selah Valley canal near Naches, Wash., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April	106	0	59.4	3,530	A.
May	118	100	109	6,700	B.
June	118	100	110	6,550	A.
July	131	112	127	7,810	A.
August	138	131	133	8,180	A.
September	138	90	101	6,010	A.
October	90	0	46.4	2,850	B.
The period	....	....	....	41,600	

NACHES RIVER NEAR NORTH YAKIMA, WASH.

Location.—In sec. 12, T. 13 N., R. 18 E., half a mile above the mouth of the river and 2 miles northwest of North Yakima.

Records available.—August 14, 1893, to February 20, 1897, fragmentary; March 1, 1898, to September 30, 1911.

Drainage area.—1,120 square miles.

Gage.—Standard chain on right bank 800 feet above the Northern Pacific Railway bridge. Prior to June 18, 1908, several different gages at practically same location.

Channel.—Gravel and cobblestones; shifting in floods.

Discharge measurements.—Made from cable 50 feet below gage.

Winter flow.—Occasionally seriously affected by ice jams; then estimated by comparison with records at other stations on same stream.

Regulation.—Flow partly regulated by storage in Bumping Lake.

Diversions.—Below all diversions.

Accuracy.—Results fair.

Discharge measurements of Naches River near North Yakima, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910		*Feet.*	*Sec.-ft.*	1911		*Feet.*	*Sec.-ft.*
Oct. 8	F. B. Storey	4.90	1,070	June 13	Howard Kimble	7.63	5,540
20	do	4.48	624	22	do	5.94	2,290
				Sept. 13	F. B. Storey	4.33	510
1911				14[a]	R. K. Ray	4.28	411
Apr. 4	do	5.70	2,040	28[a]	do	4.18	375

[a] Discard; defective meter.

Daily gage height, in feet, of Naches River near North Yakima, Wash., for the year ending Sept. 30, 1911.

[A. M. Cale, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	3.6	4.2	5.2	4.5	4.3	4.1	5.6	5.9	6.3	5.45	3.8	4.1
2	3.6	4.2	5.15	4.5	4.3	4.1	5.7	6.0	7.6	5.45	3.7	4.3
3	3.6	4.25	5.15	4.5	4.3	4.2	5.7	6.0	7.3	5.35	3.6	4.2
4	5.3	4.3	5.0	4.5	4.3	4.25	5.7	6.1	7.2	5.35	3.6	4.6
5	5.3	4.4	5.25	4.5	4.3	4.25	5.6	6.1	6.8	5.35	3.6	4.1
6	5.3	4.6	5.3	4.55	4.35	4.3	5.4	6.2	6.6	5.25	3.9	4.1
7	4.95	4.85	5.0	4.6	4.3	4.3	5.25	6.4	6.6	5.25	3.9	4.6
8	4.8	5.0	5.0	4.6	4.2	4.3	5.3	6.5	6.5	5.15	4.1	4.1
9	4.9	5.2	4.95	4.6	4.2	4.2	5.3	6.1	6.4	5.05	4.2	4.1
10	4.85	5.2	4.9	4.55	4.2	4.2	5.25	6.0	7.0	4.95	4.3	4.7
11	4.8	5.4	4.8	4.5	4.2	4.1	5.3	5.8	7.0	4.9	4.3	4.3
12	4.7	5.4	4.8	4.5	4.2	4.1	5.25	5.7	6.9	4.85	4.2	4.3
13	4.6	5.95	4.85	4.45	4.2	4.1	5.2	6.0	7.6	4.85	4.2	4.3
14	4.5	5.65	4.85	4.4	4.2	4.2	5.05	5.8	6.5	4.85	4.2	4.2
15	4.4	5.5	4.85	4.4	4.2	4.3	5.0	5.9	6.4	4.85	4.1	4.4
16	4.4	5.3	4.8	4.45	4.2	4.5	4.9	6.0	6.4	4.8	4.1	4.3
17	4.4	5.3	4.8	4.55	4.2	4.65	4.9	6.1	6.3	4.85	4.2	4.3
18	4.6	5.55	4.75	4.6	4.2	4.9	5.05	6.4	6.2	4.9	4.2	4.3
19	4.55	5.8	4.75	4.7	4.2	5.0	5.1	6.5	6.3	4.9	4.2	4.4
20	4.5	6.25	4.7	4.6	4.2	5.3	5.05	6.2	6.0	4.9	4.3	4.3
21	4.45	7.2	4.7	4.6	4.3	5.45	5.1	6.1	6.0	4.8	4.3	4.4
22	4.4	7.0	4.7	4.6	4.3	5.6	5.2	6.1	5.9	4.7	4.2	4.6
23	4.4	6.5	4.65	4.5	4.2	5.8	5.5	6.2	5.9	4.5	4.2	4.6
24	4.35	6.2	4.65	4.45	4.2	5.8	5.7	6.2	5.6	4.4	4.2	4.6
25	4.35	5.7	4.65	4.5	4.3	5.7	6.3	6.1	5.6	4.3	4.2	4.5
26	4.4	5.5	4.65	4.5	4.3	5.45	6.3	6.1	5.5	4.3	4.1	4.5
27	4.4	5.4	4.6	4.6	4.3	5.4	6.0	6.2	5.5	4.2	4.1	4.5
28	4.4	5.65	4.5	4.55	4.2	5.3	6.0	6.2	5.7	4.2	4.1	4.18
29	4.4	5.7	4.5	4.5	....	5.4	5.8	6.1	5.5	4.0	4.1	4.3
30	4.35	5.5	4.45	4.5	....	5.35	5.8	6.1	5.5	3.9	4.1	4.3
31	4.3	....	4.4	4.4	....	5.9	....	6.1	....	3.9	4.2	....

Daily discharge, in second-feet, of Naches River near North Yakima, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	145	430	1,350	633	492	373	1,900	2,340	3,020	1,690	220	373
2	145	430	1,280	633	492	373	2,040	2,500	6,620	1,690	180	492
3	145	461	1,280	633	492	430	2,040	2,500	5,550	1,550	145	430
4	1,480	492	1,100	633	492	461	2,040	2,670	5,230	1,550	145	708
5	1,480	560	1,420	633	492	461	1,900	2,670	4,100	1,550	145	373
6	1,480	708	1,480	670	526	492	1,620	2,840	3,630	1,420	268	373
7	1,050	942	1,100	708	492	492	1,420	3,220	3,630	1,420	268	708
8	890	1,100	1,100	708	430	492	1,480	3,420	3,420	1,280	373	373
9	995	1,350	1,050	708	430	430	1,480	2,670	3,220	1,160	430	373
10	942	1,350	995	670	430	430	1,420	2,500	4,630	1,050	492	793
11	890	1,620	890	633	430	373	1,480	2,190	4,630	995	492	492
12	793	1,620	890	633	430	373	1,420	2,040	5,620	942	430	492
13	708	2,420	942	596	430	373	1,350	2,500	6,620	942	430	492
14	633	1,970	942	560	430	430	1,160	2,190	5,860	942	430	430
15	560	1,760	942	560	430	492	1,100	2,340	5,110	942	373	560
16	560	1,480	890	596	430	633	995	2,500	4,350	890	373	492
17	560	1,480	890	670	430	750	995	2,670	3,600	942	430	492
18	708	1,830	842	708	430	995	1,160	3,220	2,840	995	430	492
19	670	2,190	842	793	430	1,100	1,220	3,420	3,020	995	430	560
20	633	2,930	793	708	430	1,480	1,160	2,840	2,500	995	492	492
21	596	5,230	793	708	492	1,690	1,220	2,670	2,500	890	492	560
22	560	4,630	793	708	492	1,900	1,350	2,670	2,340	793	430	708
23	560	3,420	750	633	430	2,190	1,760	2,840	2,340	633	430	708
24	526	2,840	750	596	430	2,190	2,040	2,840	1,900	560	430	708
25	526	2,040	750	633	492	2,040	3,020	2,670	1,900	492	430	633
26	560	1,760	750	633	492	1,690	3,020	2,670	1,760	492	373	633
27	560	1,620	708	708	492	1,620	2,500	2,840	1,760	430	373	633
28	560	1,970	633	670	430	1,480	2,500	2,840	2,040	430	373	419
29	560	2,040	633	633	....	1,620	2,190	2,670	1,760	319	373	492
30	526	1,760	596	633	....	1,550	2,190	2,670	1,760	268	373	492
31	492	....	560	560	....	2,340	....	2,670	....	268	430	....

NOTE.—Discharge determined from a well-defined rating curve. Discharge interpolated June 12 and 14 to 17, 1911, when observer's readings are believed to be inaccurate.

Monthly discharge of Naches River at North Yakima, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	1,480	145	693	42,600	B.
November	5,230	430	1,810	108,000	B.
December	1,480	560	927	57,000	B.
January	793	560	652	40,100	B.
February	526	430	458	25,400	B.
March	2,340	373	1,020	62,700	B.
April	3,020	995	1,710	102,000	B.
May	3,420	2,040	2,690	165,000	B.
June	6,620	1,760	3,580	213,000	C.
July	1,690	268	952	58,500	B.
August	492	145	370	22,800	B.
September	793	373	533	31,700	C.
The year	6,620	145	1,280	929,000	

NORTH YAKIMA POWER WASTE AT NORTH YAKIMA, WASH.

Location.—In sec. 18, T. 13 N., R. 19 E., between Third and Fourth streets, in North Yakima.

Records available.—July 14, 1909, to September 30, 1911.

Gage.—Vertical staff on alley bridge.

Channel.—Gravel and small stones; practically permanent.

Discharge measurements.—Made from bridge at gage.

Accuracy.—Results good.

Discharge measurements of North Yakima power waste at North Yakima, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 15	F. F. Henshaw	1.24	66.8	Mar. 29	F. B. Storey	0.29	4.41
Nov. 22	Howard Kimble	1.72	143	Apr. 13	.....do	1.37	83.7
				June 20	Howard Kimble	1.50	106
1911.				Sept. 11	F. B. Storey	1.60	120
Mar. 14	.....do	1.41	99.6	14	R. K. Ray	1.54	122

Daily gage height, in feet, of North Yakima power waste at North Yakima, Wash., for the year ending Sept. 30, 1911.

[A. A. Smith, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.6	1.4	1.3	1.6	1.5	0.8	1.4	1.4	1.5	0.9	0.8	1.3
2	1.6	1.4	1.4	1.5	1.5	.8	1.6	1.4	1.4	1.1	.9	1.4
3	1.6	1.3	1.3	1.5	1.3	.8	1.4	1.3	1.4	1.3	1.1	1.5
4	1.5	1.4	1.7	1.5	1.3	1.1	1.5	1.3	1.2	1.3	1.1	1.5
5	1.5	1.5	1.3	1.5	1.3	1.1	1.5	1.4	1.4	1.3	1.2	1.5
6	1.6	1.5	1.2	1.5	1.3	1.2	1.5	1.4	1.4	1.3	1.3	1.5
7	1.5	1.5	1.5	1.5	1.3	1.2	1.5	1.4	1.3	1.3	1.3	1.5
8	1.5	1.5	1.5	1.5	1.3	1.2	1.4	1.4	1.4	1.3	1.4	1.3
9	1.5	1.5	1.5	1.5	1.3	1.3	1.5	1.4	1.4	1.3	1.4	1.2
10	1.5	1.5	1.5	1.5	1.4	1.3	1.5	1.4	1.4	1.2	1.3	1.7
11	1.5	1.4	1.5	1.5	1.3	1.3	1.3	1.5	1.5	1.0	1.4	1.6
12	1.5	1.5	1.5	1.6	1.3	1.3	1.5	1.5	1.5	1.2	1.7	1.6
13	1.4	1.4	1.5	1.5	1.3	1.3	1.4	1.4	1.4	1.3	1.4	1.6
14	1.3	1.4	1.5	1.7	1.3	1.3	1.4	1.5	1.5	1.4	1.3	1.5
15	1.1	1.5	1.5	1.8	1.3	1.5	1.3	1.4	1.4	1.2	1.3	1.6
16	1.3	1.4	1.5	2.0	.9	1.6	1.3	1.4	1.5	1.3	1.4	1.6
17	1.2	1.5	1.5	2.0	.8	1.6	1.3	1.5	1.4	1.2	1.5	1.6
18	1.5	1.8	1.5	.5	1.1	1.5	1.4	1.5	1.4	1.2	1.3	1.6
19	1.5	1.8	1.5	.6	1.2	1.5	1.4	1.5	1.4	1.1	1.3	1.6
20	1.4	1.9	1.5	1.6	1.3	Dry.	1.4	1.5	1.5	1.0	1.4	1.6
21	1.2	1.8	1.5	1.6	1.0	Dry.	1.3	1.4	1.3	1.1	1.4	1.6
22	1.2	1.7	1.6	1.5	1.0	Dry.	1.4	1.4	1.4	1.2	1.3	1.7
23	1.1	1.7	1.6	1.4	1.0	Dry.	1.3	1.5	1.3	1.1	1.4	2.0
24	.8	1.7	1.5	1.4	.9	Dry.	1.4	1.5	1.3	.9	1.3	1.7
25	1.5	1.7	1.7	1.6	1.0	Dry.	1.3	1.6	1.1	.9	1.4	1.7
26	1.5	1.6	1.7	1.5	.9	Dry.	1.3	1.6	1.0	1.2	1.4	1.7
27	1.4	1.5	1.5	1.5	.9	Dry.	1.4	1.6	1.5	1.1	1.4	1.7
28	1.4	1.4	1.5	1.5	.8	Dry.	1.4	1.6	1.5	1.1	1.3	1.7
29	1.4	1.4	1.5	1.5	....	0.3	1.4	1.7	1.3	.8	1.3	1.6
30	1.4	1.4	1.6	1.5	....	.5	1.4	1.7	1.0	.9	1.3	1.7
31	1.4	....	1.5	1.5	....	1.5	....	1.6	....	.8	1.4	....

Daily discharge, in second-feet, of North Yakima power waste at North Yakima, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	123	92	78	123	106	30	92	92	106	37	30	78
2	123	92	92	106	106	30	123	92	92	55	37	92
3	123	78	78	106	78	30	92	78	92	78	55	106
4	106	92	140	106	78	55	106	78	66	78	55	106
5	106	106	78	106	78	55	106	92	92	78	66	106
6	123	106	66	106	78	66	106	92	92	78	78	106
7	106	106	106	106	78	66	106	92	78	78	78	106
8	106	106	106	106	78	66	92	92	92	78	92	78
9	106	106	106	106	78	78	106	92	92	78	92	66
10	106	106	106	106	92	78	106	92	92	66	78	140
11	106	92	106	106	78	78	78	106	106	46	92	123
12	106	106	106	123	78	78	106	106	106	66	140	123
13	92	92	106	106	78	78	92	92	92	78	92	123
14	78	92	106	140	78	78	92	106	106	92	78	106
15	55	106	106	159	78	106	78	92	92	66	78	123
16	78	92	106	198	37	123	78	92	106	78	92	123
17	66	106	106	198	30	123	78	106	92	66	106	123
18	106	159	106	12	55	106	92	106	92	66	78	123
19	106	159	106	17	66	106	92	106	92	55	78	123
20	92	178	106	123	78	0	92	106	106	46	92	123
21	66	159	106	123	46	0	78	92	78	55	92	123
22	66	140	123	106	46	0	92	92	92	66	78	140
23	55	140	123	92	46	0	78	106	78	55	92	198
24	30	140	106	92	37	0	92	106	78	37	78	140
25	106	140	140	123	46	0	78	123	55	37	92	140
26	106	123	140	106	37	0	78	123	46	66	92	140
27	92	106	106	106	37	0	92	123	106	55	92	140
28	92	92	106	106	30	0	92	123	106	55	78	140
29	92	92	106	106	....	5.5	92	140	78	30	78	123
30	92	92	123	106	....	12	92	140	46	37	78	140
31	92	....	106	106	....	106	....	123	....	30	92	....

NOTE.—Discharge determined from a fairly well-defined rating curve.

Monthly discharge of North Yakima power waste at North Yakima, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	123	30	93.6	5,760	B.
November	178	78	113	6,720	B.
December	140	66	106	6,520	B.
January	198	12	111	6,820	A.
February	106	30	65.4	3,630	A.
March	123	0	50.1	3,080	A.
April	123	78	92.6	5,510	A.
May	140	78	103	6,330	A.
June	106	46	88.2	5,250	A.
July	92	30	60.8	3,740	A.
August	140	30	81.6	5,020	A.
September	198	66	121	7,200	A.
The year	198	0	90.6	65,600	

NORTH YAKIMA MILLING CO. WASTE AT NORTH YAKIMA, WASH.

Location.—In sec. 18, T. 13 N., R. 19 E., between Sixth and Seventh streets in North Yakima.

Records available.—July 1, 1909, to September 30, 1911.

Gage.—Vertical staff on alley bridge.

Channel.—Gravel and small stones; practically permanent except for weeds.

Discharge measurements.—Made from the bridge at the gage.

Accuracy.—Results good.

Discharge measurements of North Yakima Milling Co. waste at North Yakima, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 15	F. F. Henshaw	1.99	76.0	May 4	F. B. Storey	1.45	52.6
				31	do	1.40	51.3
1911.				June 20	Howard Kimble	1.45	51.4
Mar. 14	F. B. Storey	1.68	68.7	July 29	F. F. Henshaw	.89	32.8
Apr. 5	do	1.58	61.0	Sept. 21	R. K. Ray	1.55	64.5

Daily gage height, in feet, of North Yakima Milling Co. waste at North Yakima, Wash., for the year ending Sept. 30, 1911.

[Edward McGann, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.8	1.8	1.2	1.80	1.80	1.80	1.75	1.40	1.50	1.30	1.10	1.52
2	1.8	1.8	1.2	1.80	1.80	1.80	1.70	1.40	1.40	1.30	1.10	1.52
3	1.8	1.8	1.3	1.80	1.80	1.80	1.70	1.50	1.40	1.40	1.20	1.35
4	1.9	1.8	1.3	1.80	1.80	1.90	1.70	1.40	1.40	1.45	1.32	1.40
5	1.9	1.9	1.3	1.80	1.80	1.90	1.70	1.40	1.30	1.29	1.39	1.43
6	1.9	1.9	1.3	1.80	1.90	1.70	1.70	1.40	1.30	1.29	1.82	1.95
7	1.8	2.0	1.3	1.80	1.90	1.75	1.50	1.40	1.40	1.20	1.80	1.98
8	1.8	1.9	1.3	1.80	1.80	1.70	1.50	1.40	1.40	1.20	1.10	1.90
9	1.9	1.9	1.4	1.80	1.80	1.80	1.50	1.40	1.50	1.28	1.08	1.90
10	2.0	1.9	1.4	1.80	1.80	1.60	1.50	1.40	1.50	1.23	1.00	1.90
11	1.9	2.0	1.4	1.80	1.80	1.60	1.20	1.40	1.50	1.23	.95	1.91
12	1.9	2.0	1.4	1.80	1.80	1.70	1.30	1.45	1.50	1.19	Dry.	1.92
13	1.8	1.9	1.4	1.80	1.80	1.55	1.30	1.40	1.60	1.30	Dry.	1.60
14	1.8	1.9	1.4	Dry.	1.80	1.70	1.30	1.50	1.30	1.42	1.10	1.65
15	1.8	1.9	1.4	Dry.	1.40	1.70	1.30	1.50	1.40	1.40	1.10	1.68
16	1.8	1.9	1.4	Dry.	2.00	1.60	1.40	1.50	1.40	1.33	1.20	1.70
17	1.8	1.6	1.45	Dry.	1.80	1.65	1.50	1.50	1.50	1.23	1.30	1.80
18	1.9	....	1.4	1.00	1.90	1.60	1.50	1.50	1.50	1.11	1.30	1.79
19	1.8	....	1.6	1.40	1.90	1.60	1.50	1.50	1.40	1.10	1.32	1.79
20	1.7	....	1.6	1.80	1.90	Dry.	1.50	1.50	1.40	1.00	1.32	1.50
21	1.7	....	1.7	1.70	1.90	Dry.	1.30	1.50	1.30	1.20	1.38	1.50
22	1.9	....	1.7	1.60	1.90	Dry.	1.30	1.50	1.30	1.15	1.35	1.60
23	1.9	....	1.7	1.60	1.90	Dry.	1.30	1.50	1.40	1.18	1.48	1.60
24	1.9	....	1.7	1.60	1.80	Dry.	1.25	1.50	1.10	1.05	1.48	1.56
25	1.9	.7	....	1.50	1.90	Dry.	1.20	1.50	1.10	.98	1.48	1.60
26	1.8	.6	....	1.60	1.85	Dry.	1.20	1.60	1.10	1.00	1.50	1.63
27	1.8	.5	1.8	1.60	1.80	Dry.	1.00	1.70	1.70	1.08	1.48	1.63
28	1.8	.5	1.8	1.90	1.80	Dry.	1.00	1.90	1.60	1.00	1.48	1.60
29	1.8	1.1	1.7	1.80	....	Dry.	1.20	1.60	1.60	.98	1.48	1.60
30	1.8	1.1	1.75	1.80	....	1.60	1.20	1.60	1.70	.98	1.50	1.60
31	1.8	....	1.8	1.80	....	1.60	....	1.50	....	.90	1.52	....

Daily discharge, in second-feet, of North Yakima Milling Co. waste at North Yakima, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	59	75	44	75	75	75	69	50	56	46	40	60
2	59	75	44	75	75	75	66	50	50	46	40	60
3	59	75	49	75	75	75	66	56	50	50	44	52
4	64	75	49	75	75	81	66	50	50	53	50	54
5	64	81	49	75	75	81	66	50	46	46	54	56
6	64	81	49	75	81	69	66	50	46	46	76	84
7	64	87	49	75	81	72	56	50	50	42	75	86
8	64	81	49	75	75	69	56	50	50	42	40	81
9	69	81	54	75	75	75	56	50	56	45	39	81
10	75	81	54	75	75	64	56	50	56	43	36	81
11	69	87	54	75	75	64	42	50	56	43	34	82
12	69	87	54	75	75	69	46	53	56	41	0	82
13	64	81	54	75	75	62	46	50	60	46	0	64
14	64	81	54	0	75	69	46	56	46	52	40	66
15	64	81	54	0	54	69	46	56	50	54	40	68
16	64	81	54	0	87	64	50	56	50	50	44	69
17	64	64	56	0	75	66	56	56	56	46	49	75
18	69	0	54	36	81	64	56	56	56	40	49	74
19	69	0	64	54	81	64	56	56	50	40	50	74
20	64	0	64	75	81	0	56	56	50	36	50	59
21	64	0	69	69	81	0	46	56	46	44	53	59
22	75	0	69	64	81	0	46	56	46	42	52	64
23	75	0	69	64	69	0	46	56	50	44	58	64
24	75	0	69	64	75	0	44	56	38	38	58	62
25	75	25	0	59	81	0	42	56	38	35	58	64
26	75	22	0	64	78	0	42	60	38	36	59	66
27	75	19	75	64	75	0	34	66	66	39	58	66
28	69	19	75	81	75	0	34	77	60	36	58	64
29	75	40	69	75	......	0	42	60	60	35	58	64
30	75	40	72	75	......	60	42	60	66	35	59	64
31	75	......	75	75	......	60	......	56	......	32	60	......

NOTE.—Discharge determined from two well-defined rating curves. Discharge Oct. 1, to Nov. 1, 1910, corrected for weed effect.

Monthly discharge of North Yakima Milling Co. waste at North Yakima, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	75	59	68.0	4,180	B.
November	87	0	50.6	3,010	B.
December	75	0	54.6	3,360	B.
January	81	0	61.1	3,760	A.
February	87	54	76.3	4,240	A.
March	81	0	46.7	2,870	A.
April	69	34	51.4	3,060	B.
May	77	50	55.2	3,390	B.
June	66	38	51.6	3,070	B.
July	54	32	42.7	2,630	B.
August	76	0	47.8	2,940	A.
September	86	52	68.2	4,060	A.
The year	87	0	56.0	40,600	

BUMPING LAKE NEAR NILE, WASH.

Location.—At lake outlet, 20 miles west of Nile.

Records available.—April 27 to November 22, 1909; November 1, 1910, to September 30, 1911.

Drainage area.—68 square miles.

Gage.—Vertical staff painted on side of gate house. Prior to November 1, 1910, a vertical staff on north shore one-fourth mile above outlet.

Regulation.—Storage regulated by operation of gates in dam.

Daily gage height, in feet, of Bumping Lake near Nile, Wash., for the year ending Sept. 30, 1911.

[J. H. Nelson, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1			99.92	93.30	93.31	93.22	93.85	96.62	100.85	123.65	126.50	108.60
2			99.72	93.28	93.30	93.17	93.96	96.85	102.45	123.95	126.50	107.60
3		95.28	99.10	93.27	93.29	93.22	94.10	97.30	103.35	124.20	126.60	106.70
4		95.73	99.28	93.25	93.31	93.20	94.32	97.72	103.60	124.85	126.65	105.80
5		95.83	99.00	93.30	93.31	93.07	94.38	98.25	103.60	125.50	126.65	104.95
6		95.73	98.84	93.25	93.28	93.01	94.42	98.65	103.80	126.15	126.50	104.90
7		95.88	98.82	93.30	93.30	92.50	94.78	99.05	103.80	126.60	126.60	105.00
8		96.58	98.87	93.27	93.30	92.60	95.25	99.02	103.80	126.80	126.00	105.20
9		96.73	97.65	93.28	93.30	92.67	95.65	99.00	104.20	126.80	125.50	105.45
10		100.73	97.32	93.27	93.28	92.58	95.72	98.82	104.40	126.80	125.20	105.70
11		101.48	97.27	93.25	93.30	92.55	95.82	98.65	105.90	126.80	124.60	105.90
12		102.03	96.70	93.25	93.30	92.63	95.72	98.42	108.20	126.75	124.00	105.80
13		102.28	96.20	93.22	93.31	92.65	95.52	98.32	110.75	126.80	123.50	105.70
14		102.08	95.45	93.24	93.32	92.62	95.00	98.07	112.70	126.83	122.90	105.60
15		101.38	95.10	93.26	93.30	92.70		97.95	114.15	126.85	122.40	105.55
16		101.33	94.95	93.27	93.29	92.75	94.65	98.07	115.40	126.85	121.70	105.90
17		100.53	94.35	93.29	93.30	92.71	94.15	98.20	116.35	126.85	120.90	106.10
18		100.33	93.95	93.31	93.28	92.68	94.32	98.45	117.10	126.80	120.20	106.20
19		98.98	93.65	93.30	93.30	92.69	94.27	98.60	117.85	126.80	119.50	105.90
20		99.35	93.42	93.34	93.29	92.70	94.32	98.50	118.55	126.70	118.70	105.60
21		101.33	93.30	93.33	93.28	92.78	94.35	98.45	119.20	126.70	117.85	105.30
22		103.38	93.35	93.33	93.30	92.87	94.42	98.70	119.85	126.60	117.10	104.35
23		102.98	93.55	93.30	93.33	93.20	94.50	98.70	120.40	126.60	116.40	103.40
24		104.10	93.62	93.30	93.32	93.25	95.20	98.75	120.80	126.60	115.50	102.45
25		104.00	93.47	93.27	93.30	93.58	95.35	98.60	121.20	126.45	114.70	101.45
26		103.55	93.42	93.28	93.32	93.60	95.85	98.40	121.60	126.40	113.90	100.55
27		102.05	93.38	93.26	93.33	93.72	96.10	98.20	122.25	126.20	113.00	99.60
28		102.02	93.32	93.27	93.29	93.77	96.30	98.10	122.80	126.10	112.20	98.80
29		101.10	93.32	93.27		93.82	96.30	98.00	123.10	126.25	111.35	98.00
30		100.05	93.30	93.31		93.87	96.52	98.40	123.45	126.30	110.40	97.20
31			93.27	93.32		93.85		99.50		126.40	109.50	

NOTE.—To reduce gage height to elevation above sea level add 3,300 feet.

Volume of storage on Bumping Lake near Nile, Wash.

Gage height.	Storage.	Gage height.	Storage.	Gage height.	Storage.	Gage height.	Storage.
Feet.	*Acre-feet.*	*Feet.*	*Acre-feet.*	*Feet.*	*Acre-feet.*	*Feet.*	*Acre-feet.*
89	0	100	4,800	110	13,700	120	24,350
90	180	101	5,600	111	14,700	121	25,500
91	380	102	6,400	112	15,700	122	26,800
92	600	103	7,200	113	16,700	123	28,000
93	950	104	8,100	114	17,800	124	29,200
94	1,300	105	9,000	115	18,900	125	30,500
95	1,700	106	9,900	116	19,900	126	31,800
96	2,200	107	10,800	117	21,000	127	33,100
97	2,800	108	11,800	118	22,100	128	34,400
98	3,400	109	12,800	119	23,200	129	35,700
99	4,100						

NOTE.—The storage table for Bumping Lake was furnished by the United States Reclamation Service.

BUMPING RIVER NEAR NILE, WASH.

Location.—At outlet of Bumping Lake, about 20 miles west of Nile.

Records available.—June 13 to July 31, 1906; April 27, 1909, to September 30, 1911.

Drainage area.—68 square miles.

Gage.—Vertical staff in two sections on opposite banks, 150 feet below the end of the spillway. In 1906 gage was located at dam site, and April 27 to July 3, 1909, at a point 450 feet below the dam.

Channel.—Bowlders and cobblestones, shifting slightly in floods.

Discharge measurements.—Made from cable or by wading near gage.

Winter flow.—Not affected by ice.

Regulation.—Flow regulated by storage in Bumping Lake. Results corrected.

Accuracy.—Results good.

Discharge measurements of Bumping River near Nile, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 19	Howard Kimble	3.35	475	Sept. 15	F. B. Storey	2.16	112
July 7	Paul Taylor	2.50	196	16	do	1.76	46.6
8	do	2.94	314				

Daily gage height, in feet, of Bumping River near Nile, Wash., for the year ending Sept. 30, 1911.

[J. H. Nelson, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.80	2.50	2.68	2.30	2.31	2.18	2.70	3.20	3.70	2.20	1.70	3.50
2	1.85	1.90	2.60	2.26	2.29	2.12	2.70	3.20	3.80	2.70	1.80	3.50
3	2.28	2.30	2.75	2.30	2.26	2.18	2.70	3.30	3.80	2.70	1.90	3.50
4	2.50	2.25	2.98	2.25	2.30	2.12	2.80	3.40	3.80	......	1.95	3.50
5	2.60	2.20	2.98	2.30	2.29	2.18	2.90	3.40	3.50	......	1.95	3.50
6	2.80	2.30	2.92	2.25	2.27	2.11	2.95	3.40	3.80	......	2.20	3.50
7	2.80	2.75	3.05	2.30	2.28	2.14	3.00	3.50	3.80	2.55	2.10	......
8	2.80	2.75	2.98	2.29	2.28	2.18	3.20	3.50	3.80	2.90	3.25	......
9	2.80	2.80	2.88	2.28	2.26	2.16	3.25	3.50	4.00	3.00	3.30	......
10	2.70	3.25	2.80	2.28	2.26	2.20	3.30	3.40	4.00	2.95	3.30	......
11	2.60	3.22	2.72	2.27	2.27	2.16	3.30	3.40	3.00	2.90	3.30	2.10
12	2.50	2.80	2.65	2.28	2.30	2.19	3.35	3.30	3.05	2.85	3.30	2.10
13	2.40	3.55	2.82	2.20	2.30	2.22	3.30	3.35	3.00	2.70	3.30	2.10
14	2.40	3.55	2.85	2.24	2.30	2.28	3.00	3.30	3.20	2.80	3.30	2.10
15	2.80	3.55	2.78	2.22	2.30	2.29	......	3.20	3.15	2.80	3.40	2.10
16	2.70	3.40	2.72	2.26	2.27	2.30	2.60	3.20	3.25	2.80	3.50	2.10
17	2.60	3.35	2.80	2.26	2.28	2.31	2.60	3.20	3.30	2.80	3.50	2.10
18	2.55	3.20	2.70	2.25	2.26	2.32	2.50	3.35	2.90	2.70	3.50	2.50
19	2.50	3.15	2.52	2.29	2.24	2.30	2.50	3.35	2.70	2.70	3.50	2.85
20	2.50	3.50	2.42	2.30	2.26	2.30	2.55	3.40	2.70	2.60	3.50	2.85
21	2.40	3.48	2.38	2.32	2.27	2.38	2.60	3.30	2.70	2.60	3.50	3.15
22	2.40	4.05	2.38	2.34	2.30	2.43	2.60	3.40	2.70	2.40	3.50	3.50
23	2.35	4.02	2.55	2.31	2.30	2.50	2.60	3.45	2.70	2.40	3.50	3.50
24	2.30	4.05	2.52	2.29	2.30	2.50	2.60	3.45	2.70	2.35	3.50	3.50
25	2.30	4.06	2.50	2.25	2.28	2.55	2.70	3.40	2.70	2.60	3.50	3.50
26	2.30	3.98	2.45	2.28	2.27	2.60	2.80	3.40	2.70	2.60	3.50	3.50
27	2.30	3.05	2.38	2.25	2.30	2.60	2.80	3.30	2.70	2.45	3.50	3.30
28	2.30	3.12	2.35	2.28	2.30	2.60	2.95	3.30	2.70	2.40	3.50	3.30
29	2.30	3.05	2.32	2.29	......	2.60	3.10	3.30	2.70	......	3.50	3.10
30	2.25	2.82	2.30	2.30	......	2.70	3.15	3.40	2.70	1.50	3.50	3.10
31	2.25	......	2.28	2.29	......	2.65	......	3.50	......	1.60	3.50	......

Daily discharge, in second-feet, of Bumping River near Nile, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	164	210	263	142	144	117	242	412	655	121	37	545
2	172	79	238	134	140	105	242	412	710	242	50	545
3	155	159	284	142	134	117	242	452	710	71	65	545
4	210	148	359	132	142	105	272	496	710	0	74	545
5	238	137	359	142	140	117	304	496	545	0	74	545
6	300	159	340	132	136	103	321	496	710	0	121	545
7	300	284	383	142	138	109	338	545	710	201	101	0
8	300	284	359	140	138	117	412	545	710	304	432	0
9	300	300	326	138	134	113	432	545	830	338	282	0
10	269	464	300	138	134	121	452	496	830	321	452	0
11	238	451	275	136	136	113	452	496	338	304	452	101
12	210	300	127	138	142	119	474	452	356	288	452	101
13	184	610	307	121	142	125	452	474	338	242	452	101
14	184	610	316	129	142	138	338	452	412	272	452	101
15	300	610	294	125	142	140	276	412	393	272	496	101
16	269	534	275	134	136	142	214	412	432	272	545	101
17	238	559	300	134	138	144	214	412	452	272	545	101
18	224	442	269	132	134	146	188	474	304	242	545	188
19	210	421	216	140	129	142	188	474	242	242	545	288
20	210	584	189	142	134	142	201	496	242	214	545	288
21	184	574	179	146	136	160	214	452	242	214	545	393
22	184	908	179	151	142	171	214	496	242	164	545	545
23	172	888	224	144	142	188	214	520	242	164	545	545
24	159	908	216	140	142	188	214	520	242	153	545	545
25	159	908	210	132	138	201	242	496	242	214	545	545
26	159	862	197	138	136	214	272	496	242	214	545	545
27	159	383	179	132	142	214	272	452	242	176	545	452
28	159	408	172	138	142	214	321	452	242	51	545	452
29	159	383	164	140	......	214	374	452	242	0	545	374
30	148	307	159	142	......	242	393	496	242	18	545	374
31	148	......	155	140	......	228	......	545	......	26	545	......

NOTE.—Discharge determined from a rating curve well defined above 35 second-feet. Discharge for July 3 and 28 and Aug. 9 is reduced as the gates in the dam were closed during parts of these days. Gates were closed all day July 4 to 6 and 29 and Sept. 7 to 10, and no water was flowing.

Monthly discharge of Bumping River near Nile, Wash., for the year ending Sept. 30, 1911.

[Drainage area, 68 square miles.]

Month.	Observed discharge (second-feet).			Run-off (total in acre-feet).			Discharge without storage (second-feet).		Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Observed.	Stored.	Without storage.	Mean.	Per square mile.		
October	300	64	202	12,400	0	12,400	202	2.96	3.41	A.
November	908	79	462	27,500	+ 3,000	30,500	513	7.54	8.41	A.
December	383	127	252	15,500	− 3,800	11,700	190	2.79	3.22	A.
January	151	121	137	8,420	+ 18	8,440	137	2.01	2.32	A.
February	144	129	138	7,660	− 10	7,650	138	2.03	2.11	A.
March	242	103	152	9,350	+ 196	9,550	155	2.28	2.63	A.
April	474	188	299	17,800	+ 1,260	19,100	321	4.72	5.27	A.
May	545	412	479	29,500	+ 1,940	31,400	511	7.51	8.66	A.
June	830	242	435	25,900	+24,100	50,000	840	12.4	13.83	A.
July	338	0	181	11,100	+ 3,780	14,900	242	3.56	4.10	A.
August	545	37	410	25,200	−19,100	6,100	99.2	1.46	1.68	A.
September	545	0	317	18,900	−10,300	8,600	145	2.13	2.38	A.
The year	908	0	289	209,000	+ 1,080	210,000	290	4.26	58.02	

AMERICAN RIVER NEAR NILE, WASH.

Location.—At a highway bridge in T. 17 N., R. 14 E., three-fourths mile above the mouth of the river, about 17 miles northwest of Nile, and below all tributaries.

Records available.—April 25 to November 1, 1909; May 26 to November 15, 1910; May 18 to September 30, 1911.

Drainage area.—78 square miles.

Gage.—Vertical staff on right abutment of highway bridge.

Channel.—Gravel and bowlders; shifting slightly in floods.

Discharge measurements.—Made from highway bridge.

Accuracy.—Results fair.

Discharge measurements of American River near Nile, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 18	Howard Kimble	3.05	515
July 8	Paul Taylor	2.70	379
Sept. 15	F. B. Storey	1.95	100
17	....do	2.00	112

Daily gage height, in feet, and discharge, in second-feet, of American River near Nile, Wash., for the year ending Sept. 30, 1911.

[G. M. Denton, observer.]

Day.	Oct.		Nov.		May.		June.		July.		Aug.		Sept.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	1.62	60	1.75	82	......	......	4.0	1,160	2.9	432	2.0	111	1.7	57
2	2.75	374	1.75	82	......	......	4.1	1,240	2.8	384	2.0	111	1.7	57
3	2.86	352	1.9	109	......	......	3.8	1,010	......	408	......	111	......	62
4	2.68	344	1.8	90	......	......	3.5	800	2.9	432	2.0	111	......	68
5	2.65	332	1.8	90	......	......	......	732	3.0	484	2.0	111	1.8	73
6	2.5	276	1.9	109	......	......	3.3	665	3.1	540	......	111	1.8	73
7	2.45	258	1.9	109	......	......	3.4	730	2.9	432	......	111	......	82
8	2.35	230	2.4	241	......	......	3.3	665	2.8	384	2.0	111	1.9	91
9	2.3	210	2.8	396	......	......	3.3	665	2.7	339	2.0	111	1.9	91
10	2.2	180	3.5	816	......	......	3.4	730	......	339	......	101	......	91
11	2.8	396	4.0	1,180	......	......	3.8	1,010	2.7	339	1.9	91	......	91
12	2.0	130	3.2	618	......	......	......	1,200	2.6	297	1.9	91	1.9	91
13	2.0	130	2.8	396	......	......	4.3	1,400	2.6	297	......	85	1.9	91
14	1.93	115	2.7	352	......	......	4.2	1,320	2.7	339	......	79	......	91
15	1.9	109	2.5	276	......	......	4.0	1,160	2.6	297	1.8	73	1.9	91
16	1.88	105	......	......	......	......	3.8	1,010	......	284	1.8	73	1.9	91
17	1.89	107	......	......	......	......	3.6	870	......	271	......	65	......	91
18	2.25	195	......	......	3.1	540	3.5	800	2.5	258	1.8	57	......	91
19	2.0	130	......	......	......	530	......	700	2.4	222	1.8	57	1.9	91
20	1.95	120	......	......	......	518	3.2	600	......	206	......	62	1.9	91
21	1.9	109	......	......	......	506	3.2	600	2.3	189	......	68	......	91
22	1.9	109	......	......	......	495	3.3	665	2.3	189	1.8	73	1.9	91
23	1.88	105	......	......	3.0	484	3.1	540	......	179	1.7	57	1.9	91
24	1.85	100	......	......	3.0	484	3.0	484	......	169	......	57	......	91
25	1.85	100	......	......	3.0	484	2.9	432	2.2	159	1.7	57	......	91
26	1.95	120	......	......	2.9	432	......	458	2.2	159	1.7	57	1.9	91
27	1.9	109	......	......	2.9	432	3.0	484	......	146	......	57	1.8	73
28	1.85	100	......	......	2.9	432	3.2	600	2.1	133	......	57	......	82
29	1.8	90	......	......	......	516	3.1	540	2.1	133	1.7	57	1.9	91
30	1.8	90	......	......	3.2	600	3.0	484	......	126	1.7	57	1.9	91
31	1.78	87	......	......	3.5	800	......	......	......	118	......	57	......	......

NOTE.—Discharge determined from a fairly well-defined rating curve. Discharge interpolated for days when no gage height was reported.

Monthly discharge of American River near Nile, Wash., for the year ending Sept. 30, 1911.

[Drainage area, 78 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	374	60	170	2.18	2.51	10,500	B.
November 1-15	1,180	82	330	4.23	2.36	9,820	B.
May 18-31	800	432	518	6.64	3.46	14,400	B.
June	1,400	432	792	10.2	11.38	47,100	B.
July	540	118	280	3.59	4.14	17,200	B.
August	111	57	80.2	1.03	1.19	4,930	B.
September	91	57	84.6	1.08	1.20	5,030	B.

TIETON RIVER AT McALLISTER MEADOWS, NEAR NACHES, WASH.

Location.—About 800 feet above the McAllister Meadow dam site, half a mile above Wildcat Creek, 1½ miles below the junction of the forks of the river, 9 miles above the headworks of Tieton canal, and about 30 miles southwest of Naches.

Records available.—August 25, 1908, to September 30, 1911; fragmentary.

Drainage area.—187 square miles.

Gage.—Vertical staff on left bank.

Channel.—Gravel; practically permanent.

Discharge measurements.—Made from cable 100 feet below gage, or by wading near gage.

Winter flow.—Not affected by ice.

Accuracy.—Results fair.

The following discharge measurement was made by R. K. Ray:

August 15, 1911: Gage height, 1.73 feet; discharge, 290 second-feet.

Daily gage height, in feet, of Tieton River at McAllister Meadows, near Naches, Wash., for the year ending Sept. 30, 1911.

[John Russell, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.82		1.93				2.40				2.05	
2	1.58	1.50	2.00						3.8	2.7		
3	3.29		2.02					2.6			2.05	1.80
4	2.60	1.52	1.99	1.60			1.82		3.4	2.75		
5	2.15		1.95								2.00	2.10
6	2.32	1.65	1.90					2.65		2.8		
7	2.45	2.09	1.88	1.65		1.35	2.00		3.05		1.80	1.80
8	2.25	2.4	1.87					2.6		2.45		
9	2.27	1.92	1.81						3.1		1.75	2.85
10	2.05	4.6	1.72			1.35		2.45		2.30		
11	1.85	3.25	1.71	1.60			2.05		3.8		1.75	1.80
12	1.8	2.64	1.73					2.40		2.25		
13	1.7	2.25							4.4		1.75	1.70
14	1.68	2.10		1.65		1.35		2.35		2.5		
15	1.65						1.90		3.7		1.70	1.90
16	1.64	1.99	1.65					2.55		2.6		
17	2.55					1.45			3.4		1.80	1.70
18		1.89		1.60						2.40		
19	1.80						1.95	2.7	2.9			1.65
20		2.00	1.62							2.20	1.85	
21	1.68	4.17				1.85			2.5			1.80
22	1.66	3.20		1.55			2.15	2.7		2.10	1.80	
23		2.71	1.75						2.7			1.55
24	1.87	2.48								2.40	1.75	
25	2.56	2.29		1.60		2.0		2.6	2.7			
26	1.89	2.21					2.6			2.30		1.55
27	1.74	2.12	1.65					2.5			1.70	
28	1.68	2.09				1.9			3.0	2.04		1.50
29	1.67	2.02		1.54			2.5	2.6			1.70	
30		1.99							2.7	2.15		1.48
31	1.60		1.58					3.25			1.75	

Daily discharge, in second-feet, of Tieton River at McAllister Meadows, near Naches, Wash., for the year ending Sept. 30, 1911.

[John Russell, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	308	220	352	230	......	162	590	672	1,430	660	405	288
2	229	208	380	220	......	162	496	694	1,640	780	405	294
3	1,210	210	390	230	......	162	402	715	1,470	796	405	300
4	715	213	376	230	......	162	308	740	1,300	812	392	365
5	455	205	360	230	......	162	332	770	1,200	830	380	430
6	542	250	340	238	......	162	356	748	1,110	845	340	365
7	620	425	332	246	......	162	380	700	1,020	730	300	300
8	505	590	328	246	......	162	386	715	980	620	291	589
9	515	348	304	246	......	162	392	668	1,060	575	282	878
10	405	2,410	272	238	......	162	398	620	1,350	530	282	589
11	320	1,180	268	230	......	162	405	605	1,640	518	282	300
12	300	741	276	190	......	162	388	590	1,920	505	282	282
13	265	505	270	160	......	162	372	575	2,210	578	282	263
14	259	430	270	246	......	162	356	560	1,880	650	272	250
15	250	400	270	270	......	170	340	580	1,550	682	268	340
16	246	376	250	300	......	178	345	682	1,420	715	281	302
17	682	340	230	280	......	186	350	714	1,300	652	300	263
18	350	336	230	230	......	219	355	747	1,100	590	306	254
19	300	320	230	220	......	252	360	730	910	535	313	246
20	270	380	240	220	......	286	391	700	780	480	320	273
21	259	1,980	250	215	......	320	423	720	650	455	310	300
22	253	1,140	250	215	......	410	455	780	715	430	300	258
23	230	786	282	215	......	500	518	700	780	510	291	215
24	328	638	280	220	......	440	580	708	700	590	282	215
25	689	525	270	230	......	380	760	715	780	560	275	215
26	336	485	270	210	......	350	715	682	840	530	269	215
27	279	440	250	212	......	320	694	650	910	465	263	208
28	259	425	240	212	......	340	672	682	980	400	250	200
29	256	390	240	212	......	400	650	715	880	428	263	190
30	240	376	230	210	......	460	650	800	780	455	272	195
31	234	......	229	200	......	520	......	1,220	......	430	282	......

NOTE.—Discharge determined from a rating curve well defined below 1,200 second-feet. Discharge for February, 1911, and for days on which gage was not read estimated from hydrograph comparison with the station at the headworks.

Monthly discharge of Tieton River at McAllister Meadows, near Naches, Wash., for the year ending Sept. 30, 1911.

[Drainage area, 187 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	1,210	229	391	2.09	2.41	24,000	A.
November	2,410	205	576	3.08	3.44	34,300	A.
December	390	229	282	1.51	1.71	17,300	B.
January	300	160	227	1.21	1.40	14,000	B.
February	....	....	180	.963	1.00	10,000	C.
March	520	162	258	1.38	1.59	15,900	B.
April	760	308	461	2.47	2.76	27,400	B.
May	1,220	560	708	3.79	4.37	43,500	B.
June	2,210	650	1,180	6.31	7.04	70,200	B.
July	845	400	591	3.16	3.64	36,300	B.
August	405	250	305	1.63	1.88	18,800	B.
September	878	190	306	1.64	1.83	18,200	B.
The year	2,410	....	456	2.44	33.07	330,000	

TIETON RIVER AT HEADWORKS OF TIETON CANAL, NEAR NACHES, WASH.

Location.—In sec. 30, T. 13 N., R. 15 E., 500 feet below the intake of Tieton canal, 15 miles above the mouth of the river, and 21 miles southwest of Naches.

Records available.—March 29, 1906, to September 30, 1911. Record for 1906 fragmentary.

Drainage area.—247 square miles.

Gage.—Friez automatic gage referred to vertical staff on right bank. Bristol automatic gage used July 28, 1909, to July 17, 1911. March 29, 1906, to June 27, 1907, a vertical staff 1 mile below present location.

Channel.—Gravel and cobblestones; shifting in floods.

Discharge measurements.—Made from cable 20 feet above gage or by wading near gage.

Winter flow.—Occasionally seriously affected by anchor ice; then estimated by comparison with records at other stations on the river.

Diversions.—Tieton canal diverts about 500 feet above the station.

Accuracy.—Results good.

Discharge measurements of Tieton River at headworks of Tieton canal, near Naches, Wash., for the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 19	F. B. Storey	3.05	396
May 25	C. F. Gleason	3.83	788
Aug. 14	R. K. Ray	2.69	244

Daily gage height, in feet, of Tieton River at headworks of Tieton canal, near Naches, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.83	2.64	3.06	2.69	2.63	2.54	3.66	3.69	5.00	3.54	2.84	2.76
2	2.74	2.66	3.10	2.66	2.65	2.54	3.60	3.75	5.00	3.62	2.78	2.78
3	3.87	2.64	3.19	2.70	2.66	2.49	3.54	3.78	4.75	3.72	2.86	2.80
4	3.57	2.61	3.09	2.70	2.64	2.52	3.47	3.86	4.45	3.78	2.87	2.63
5	3.28	2.60	3.05	2.68	2.62	2.52	3.34	3.94	4.25	3.82	2.84	2.97
6	3.32	2.63	3.04	2.72	2.63	2.59	3.28	3.82	4.25	3.89	2.83	2.80
7	3.52	2.92	3.02	2.82	2.61	2.58	3.24	3.72	4.25	3.76	2.82	2.81
8	3.38	3.24	3.02	2.81	2.59	2.56	3.24	3.82	4.15	3.44	2.74	2.82
9	3.42	3.02	2.99	2.84	2.58	2.55	3.32	3.67	4.20	3.34	2.81	3.44
10	3.14	4.82	2.87	2.75	2.56	2.54	3.30	3.57	4.45	3.28	2.74	3.22
11	3.00	4.54	2.86	2.72	2.55	2.53	3.23	3.54	5.00	3.25	2.77	2.97
12	2.92	3.82	2.91	2.68	2.56	2.50	3.16	3.56	5.30	3.24	2.76	2.93
13	2.88	3.52	2.90	2.50	2.56	2.52	3.10	3.53	5.40	3.28	2.72	2.86
14	2.80	3.36	2.89	2.62	2.54	2.56	3.08	3.47	5.30	3.40	2.75	2.78
15	2.82	3.23	2.88	2.69	2.51	2.66	3.06	3.48	4.90	3.48	2.66	3.07
16	2.79	3.13	2.90	2.76	2.59	2.76	3.09	3.68	4.75	3.57	2.68	3.00
17	3.22	3.05	2.80	2.92	2.59	2.78	3.09	3.78	4.50	3.54	2.71	2.86
18	3.24	3.00	2.74	2.95	2.57	2.88	3.16	3.84	4.30	3.36	2.76	2.79
19	2.95	2.94	2.74	2.88	2.54	3.00	3.12	3.74	4.15	3.30	2.74	2.74
20	2.84	3.06	2.72	2.85	2.50	3.18	3.15	3.63	4.05	3.17	2.71	2.72
21	2.81	5.10	2.74	2.78	2.51	3.26	3.26	3.68	4.00	3.10	2.63	2.79
22	2.74	4.41	2.74	2.67	2.49	3.36	3.34	3.82	4.10	3.00	2.64	2.74
23	2.66	3.96	2.82	2.68	2.48	3.55	3.48	3.76	4.00	2.96	2.65	2.69
24	2.76	3.66	2.90	2.78	2.52	3.48	3.70	3.84	3.74	3.06	2.64	2.63
25	3.51	3.42	2.82	2.68	2.50	3.38	3.97	3.86	3.71	3.11	2.66	2.53
26	3.05	3.36	2.84	2.63	2.52	3.31	3.82	3.80	3.88	3.12	2.66	2.43
27	2.82	3.31	2.76	2.66	2.54	3.26	3.77	3.80	4.20	2.93	2.60	2.42
28	2.72	3.24	2.75	2.67	2.51	3.28	3.72	3.84	3.99	2.88	2.62	2.35
29	2.72	3.18	2.74	2.66	......	3.39	3.68	3.84	3.72	2.94	2.65	2.29
30	2.68	3.11	2.75	2.68	......	3.50	3.66	4.05	3.59	2.96	2.73	2.56
31	2.67	......	2.75	2.65	......	3.60	......	4.50	......	2.86	2.78	......

Daily discharge, in second-feet, of Tieton River at headworks of Tieton canal, near Naches, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	307	238	406	237	218	191	683	700	1,700	620	292	262
2	273	246	425	227	224	191	650	732	1,700	661	269	269
3	828	238	467	240	227	177	620	749	1,460	716	300	276
4	664	228	420	240	221	186	585	796	1,200	749	304	218
5	511	225	402	234	214	186	520	844	1,040	772	292	347
6	531	235	397	247	218	205	490	772	1,040	814	288	276
7	637	344	387	284	211	202	471	716	1,040	738	284	280
8	563	492	387	280	205	197	471	772	978	570	254	284
9	584	387	374	292	202	194	510	688	1,010	520	280	570
10	444	1,510	323	258	197	191	500	635	1,200	490	254	462
11	378	1,270	319	247	194	188	466	620	1,700	476	265	347
12	345	800	339	234	197	180	434	630	2,040	471	262	329
13	327	637	335	180	197	186	406	615	2,160	490	247	300
14	295	552	331	214	191	197	395	585	2,040	550	258	269
15	303	487	327	237	183	227	388	590	1,600	590	227	392
16	291	439	335	262	205	262	401	694	1,460	635	234	360
17	482	402	295	325	205	269	401	749	1,240	620	244	300
18	492	378	273	338	200	308	434	784	1,080	530	262	272
19	356	352	273	308	191	360	415	727	978	500	254	254
20	311	406	265	296	180	443	429	666	912	438	244	247
21	299	1,790	273	269	183	481	481	694	880	406	218	272
22	273	1,180	273	230	177	530	520	772	945	360	221	254
23	246	881	303	234	175	625	590	738	880	342	224	237
24	280	712	335	269	186	590	705	784	727	388	221	218
25	631	584	303	234	180	540	862	796	710	411	227	188
26	402	552	311	218	186	505	772	760	808	415	227	162
27	303	526	280	227	191	471	744	760	1,010	329	208	159
28	265	492	276	230	183	490	716	784	874	308	214	144
29	265	463	273	227	....	545	694	784	716	334	224	130
30	251	430	276	234	....	600	683	912	645	342	251	197
31	248	....	276	224	....	650	....	1,240	....	300	269	....

NOTE.—Discharge determined from a rating curve well defined below 1,700 second-feet.

Monthly discharge of Tieton River at headworks of Tieton canal, near Naches, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off.	Accuracy.
	Maximum.	Minimum.	Mean.	Total in acre-feet.	
October	828	246	400	24,600	A.
November	1,790	225	583	34,700	A.
December	467	265	331	20,400	A.
January	338	180	251	15,400	A.
February	227	175	198	11,000	A.
March	650	177	341	21,000	A.
April	862	388	548	32,600	A.
May	1,240	585	745	45,800	A.
June	2,160	645	1,190	70,800	A.
July	814	300	512	31,500	A.
August	304	208	252	15,500	A.
September	570	130	276	16,400	A.
The year	2,160	130	469	340,000	

TIETON CANAL NEAR NACHES, WASH.

Location.—In sec. 30, T. 14 N., R. 15 E., just below the headgate and about 21 miles above Naches.

Records available.—1910 and 1911; irrigation season only.

Gage.—Float gage in stilling box.

Channel.—Earth section of canal.

Discharge measurements.—Made from a footbridge at the gage.

Accuracy.—Results good.

Cooperation.—Records furnished by the United States Reclamation Service.

Daily gage height, in feet, and discharge, in second-feet, of Tieton canal, near Naches, Wash., for the year ending Sept. 30, 1911.

Day.	April.		May.		June.		July.		August.		September.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	......	0.0	1.14	31.9	1.22	36.7	2.44	120	2.49	123	2.11	97
2	......	.0	1.27	39.8	1.34	44.1	2.24	106	2.46	121	2.13	98
3	......	.0	1.27	39.8	1.39	47.2	2.24	106	2.42	118	2.13	98
4	......	.0	1.39	47.2	1.42	49.0	2.24	106	2.38	116	2.11	97
5	0.50	5.0	1.43	49.7	1.45	51	2.24	106	2.35	114	1.98	88
6	.79	15.1	1.43	49.7	1.48	53	2.24	106	2.35	114	1.63	63
7	.94	21.8	1.56	58	1.76	72	2.27	108	2.28	109	1.41	49.4
8	.94	21.8	1.56	58	1.94	85	2.30	110	2.20	103	1.19	34.9
9	.94	21.8	1.56	58	2.08	95	2.32	111	2.20	103	.95	22.5
10	1.00	24.5	1.56	58	2.15	100	2.38	116	2.20	103	.95	22.5
11	1.05	27.0	1.56	58	2.15	100	2.44	120	2.14	99	.95	22.5
12	1.05	27.0	1.56	58	2.15	100	2.51	125	2.08	95	.95	22.5
13	1.05	27.0	1.56	58	2.15	100	2.60	132	1.98	88	.95	22.5
14	1.05	27.0	1.56	58	2.15	100	2.70	140	1.88	81	.95	22.5
15	1.05	27.0	1.56	58	2.18	102	2.74	143	1.96	86	.95	22.5
16	1.05	27.0	1.53	56	2.32	111	2.74	143	2.00	89	.95	22.5
17	1.05	27.0	1.50	54	2.37	115	2.74	143	2.06	93	.95	22.5
18	1.05	27.0	1.50	54	2.50	124	2.74	143	2.17	101	.95	22.5
19	1.05	27.0	1.50	54	2.54	127	2.67	138	2.17	101	.95	22.5
20	1.05	27.0	1.50	54	2.58	130	2.64	135	2.17	101	1.10	29.5
21	1.05	27.0	1.50	54	2.58	130	2.60	132	2.14	99	1.10	29.5
22	1.05	27.0	1.50	54	2.58	130	2.60	132	2.10	96	1.10	29.5
23	1.05	27.0	1.50	54	2.58	130	2.60	132	2.14	99	1.01	25.0
24	1.14	31.9	1.22	36.7	2.61	133	2.60	132	2.20	103	1.28	40.4
25	1.14	31.9	.72	12.3	2.70	140	2.60	132	2.20	103	1.40	47.8
26	1.14	31.9	.72	12.3	2.70	140	2.60	132	2.23	105	1.94	85
27	1.14	31.9	.72	12.3	2.70	140	2.60	132	2.23	105	1.94	85
28	1.14	31.9	1.04	26.5	2.58	130	2.60	132	2.23	105	2.14	99
29	1.14	31.9	1.04	26.5	2.58	130	2.53	127	2.16	100	2.40	117
30	1.14	31.9	1.04	26.5	2.58	130	2.46	121	2.02	90	1.10	29.5
31	......	......	1.04	26.5	......	......	2.48	123	2.05	92	......	......

Monthly discharge of Tieton canal near Naches, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April	31.9	0	22.8	1,360
May	58	12.3	45.0	2,770
June	140	36.7	102	6,070
July	143	106	125	7,690
August	123	81	102	6,270
September	117	22.5	49.7	2,960
The period	......	......	......	27,100

TIETON RIVER AT COBB'S RANCH, NEAR NACHES, WASH.

Location.—In sec. 3, T. 14 N., R. 16 E., 200 feet below Oak Creek, 1½ miles above the mouth of the river and 8 miles northwest of Naches.

Records available.—April 24, 1902, to July 10, 1907; April 21, 1909, to September 30, 1911.

Drainage area.—289 square miles.

Gage.—Standard chain on left bank since March 5, 1910. April 14, 1909, to March 5, 1910, an inclined staff at same location and datum. Prior to April 14, 1909, gage was located at various places as outlined in Water-Supply Paper 292.

Channel.—Rocks and gravel; shifting in floods.

Discharge measurements.—Made from cable 60 feet below gage.

Winter flow.—Not seriously affected by ice.

Diversions.—Tieton canal diverts above the station.

Accuracy.—Results fair.

Discharge measurements of Tieton River at Cobb's ranch, near Naches, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*
Nov. 23	Howard Kimble	5.92	987
1911.			
Mar. 21	F. B. Storey	5.13	561
Apr. 19	do	4.90	417
Aug. 14	R. K. Ray	4.52	269

Daily gage height, in feet, of Tieton River at Cobb's ranch, near Naches, Wash., for the year ending Sept. 30, 1911.

[Philip Trudell, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1		5.3	5.5		5.4	4.6	4.4
2		5.5	5.5		5.4	4.6	4.4
3		5.4	5.5		5.3	4.6	4.4
4		5.2	5.6	6.2	5.3	4.7	4.4
5		5.2	5.7	6.1	5.3	4.7	4.4
6		5.1	5.7	6.0	5.2	4.6	4.5
7		5.0	5.7	6.0	5.2	4.6	4.5
8		5.0	5.6	6.0	5.2	4.5	4.6
9		5.0	5.6	6.0	5.3	4.5	4.6
10		5.0	5.4	5.9	5.3	4.5	4.6
11		5.0	5.4	6.0	5.3	4.4	4.6
12		5.0	5.3	6.0	5.4	4.4	4.5
13		4.9	5.3	6.1	5.4	4.4	4.5
14		4.8	5.3	6.1	5.4	4.4	4.5
15		4.8	5.4	6.2	5.4	4.4	4.4
16		4.8	5.4	6.3	5.3	4.3	4.4
17		4.8	5.5	6.4	5.3	4.3	4.4
18		4.8	5.6	6.3	5.3	4.3	4.4
19		4.9	5.7	6.2	5.2	4.2	4.4
20		5.0	5.7	6.1	5.2	4.2	4.4
21	5.1	5.0		6.0	5.1	4.2	4.4
22	5.2	5.0		5.9	5.0	4.3	4.4
23	5.4	5.3		5.7	4.9	4.3	4.3
24	5.3	5.4		5.5	4.9	4.3	4.2
25	5.3	5.6		5.4	4.9	4.3	4.2
26	5.0	5.7		5.4	4.8	4.3	4.0
27	5.0	5.7		5.3	4.8	4.4	3.9
28	5.1	5.6		5.4	4.8	4.4	3.9
29	5.2	5.5		5.4	4.7	4.4	3.9
30	5.2	5.5		5.4	4.6	4.4	4.2
31	5.4				4.6	4.4	

Daily discharge, in second-feet, of Tieton River at Cobb's ranch, near Naches, Wash., for 1910.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	1,560	990	1,260	1,800	720	340	240
2	....	1,700	930	1,100	1,340	720	322	240
3	....	2,360	900	1,060	1,100	660	322	255
4	....	1,660	840	1,180	1,180	660	322	270
5	....	1,480	870	1,140	1,100	660	340	270
6	....	1,060	900	1,260	1,140	602	305	270
7	....	930	870	1,560	1,060	720	360	228
8	....	900	870	1,750	870	720	360	215
9	....	900	870	2,000	840	780	380	215
10	....	870	900	2,420	960	720	402	204
11	....	990	990	2,530	1,520	720	360	204
12	....	1,100	1,140	2,000	1,430	720	360	192
13	....	1,220	1,140	1,800	1,180	780	360	192
14	....	1,430	1,060	1,610	1,020	720	360	192
15	....	1,520	990	1,340	1,020	602	340	182
16	....	1,660	1,060	1,260	960	602	305	215
17	....	1,950	1,180	1,260	900	602	288	240
18	....	2,000	1,220	1,340	900	548	322	240
19	....	2,750	1,660	1,260	840	495	322	240
20	....	3,380	1,950	1,180	900	495	340	....
21	....	3,380	1,850	1,180	780	495	340	....
22	....	2,870	1,750	1,260	720	602	340	....
23	....	2,420	1,750	1,340	660	495	340	....
24	....	1,950	2,200	2,000	630	448	305	....
25	....	1,610	2,700	1,950	720	448	255	....
26	....	1,480	2,990	1,520	840	402	255	....
27	....	1,340	2,260	1,430	780	402	255	....
28	810	1,220	1,950	1,180	720	402	270	....
29	....	1,060	1,560	1,180	720	402	255	....
30	....	1,020	1,380	1,300	660	380	240	....
31	....	990	....	1,340	....	360	255	....

NOTE.—Discharge determined from a rating curve well defined above 150 second-feet.

Daily discharge, in second-feet, of Tieton River at Cobb's ranch, near Naches, Wash., for the year ending Sept. 30, 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	630	750	1,600	690	305	240
2	....	750	750	1,500	690	305	240
3	....	690	750	1,300	630	305	240
4	....	575	810	1,220	630	340	240
5	....	575	870	1,140	630	340	240
6	....	520	870	1,060	575	305	270
7	....	470	870	1,060	575	305	270
8	....	470	810	1,060	575	270	305
9	....	470	810	1,060	630	270	305
10	....	470	690	990	630	270	305
11	....	470	690	1,060	630	240	305
12	....	470	630	1,060	690	240	270
13	....	425	630	1,140	690	240	270
14	....	380	630	1,140	690	240	270
15	....	380	690	1,220	690	240	240
16	....	380	690	1,300	630	215	240
17	....	380	750	1,380	630	215	240
18	....	380	810	1,300	630	215	240
19	....	425	870	1,220	575	192	240
20	....	470	870	1,140	575	192	240
21	520	470	800	1,060	520	192	240
22	575	470	800	990	470	215	240
23	690	630	800	870	425	215	215
24	630	690	800	750	425	215	192
25	630	810	800	690	425	215	192
26	470	870	750	690	380	215	155
27	470	870	750	630	380	240	139
28	520	810	750	690	380	240	139
29	575	750	750	690	340	240	139
30	575	750	900	690	305	240	192
31	690	....	1,200	....	305	240	....

NOTE.—Discharge determined from a rating curve well defined above 150 second-feet. Discharge May 21 to June 3 estimated from hydrograph comparison with the station at the headworks.

Monthly discharge of Tieton River at Cobb's ranch, near Naches, Wash., for 1910.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
March	3,380	870	1,640	101,000	B.
April	2,990	840	1,390	82,700	B.
May	2,530	1,060	1,480	91,000	B.
June	1,800	630	976	58,100	B.
July	780	360	583	35,800	B.
August	402	240	320	19,700	B.
September 1-19	270	182	227	8,550	B.
The period				397,000	

Monthly discharge of Tieton River at Cobb's ranch, near Naches, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
March 21-31	690	470	577	12,600	A.
April	870	380	563	33,500	A.
May	1,200	630	785	48,300	B.
June	1,600	630	1,060	63,100	B.
July	690	305	550	33,800	A.
August	340	192	249	15,300	A.
September	305	139	235	14,000	B.
The period				221,000	

NORTH FORK OF ATANUM CREEK NEAR TAMPICO, WASH.

Location.—In sec. 2, T. 12 N., R. 15 E., about 100 feet below Nasty Creek, and about 3½ miles northwest of Tampico.

Records available.—August 26, 1907, to August 25, 1911; fragmentary.

Drainage area.—66 square miles.

Gage.—Vertical staff on left bank.

Channel.—Gravel and bowlders; shifting in floods.

Discharge measurements.—Made from a cable 500 feet below gage or by wading.

Winter flow.—Not seriously affected by ice.

Diversions.—Above all diversions.

Accuracy.—Results fair.

Cooperation.—Expense of maintenance borne by United States Office of Indian Affairs.

Discharge measurements of North Fork of Atanum Creek near Tampico, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
1911.		*Feet.*	*Sec.-ft.*
Mar. 7[a]	Howard Kimble	1.22	20.0
Apr. 5	F. B. Storey	1.78	85.9

[a] Ice on riffle.

Daily gage height, in feet, of North Fork of Atanum Creek near Tampico, Wash., for the year ending Sept. 30, 1911.

[George Prior, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1	1.2	1.2	1.4	1.2	1.3	1.5	....	2.3	2.8	1.9	1.4
2	1.2	1.2	1.4	1.2	1.3	1.6	....	2.4	2.8	1.9	1.3
3	1.4	1.2	1.4	1.2	1.3	1.2	....	2.2	2.7	1.9	1.3
4	1.4	1.2	1.4	1.3	1.2	1.2	....	2.3	2.7	1.8	....
5	1.3	1.2	1.4	1.3	1.3	1.2	1.78	2.2	2.6	1.8	....
6	1.3	1.2	1.3	1.3	1.3	1.2	....	2.3	2.4	1.8	....
7	1.3	1.2	1.3	1.3	1.3	1.2	....	2.2	2.5	1.8	....
8	1.3	1.2	1.3	1.3	1.3	1.2	....	2.2	2.4	1.7	....
9	1.3	1.2	1.3	1.3	1.3	1.2	1.8	2.1	2.5	1.7	....
10	1.3	1.3	1.2	1.3	1.3	1.2	1.8	2.0	2.3	1.6	....
11	1.2	1.4	1.3	1.2	1.3	1.2	2.0	2.0	2.3	1.6	....
12	1.3	1.3	1.3	1.2	1.3	1.2	1.9	2.0	2.5	1.6	1.3
13	1.3	1.3	1.3	1.2	1.3	1.2	2.0	2.0	2.3	1.6	1.3
14	1.3	1.3	1.3	1.4	1.3	1.3	2.0	1.9	2.3	1.6	1.3
15	1.3	1.3	1.3	1.4	1.8	1.3	1.8	1.9	2.3	1.6	1.3
16	1.3	1.3	1.3	1.4	1.3	2.0	2.0	2.0	2.4	1.6	1.3
17	1.3	1.3	1.3	1.4	1.3	2.0	1.8	2.1	2.3	1.6	1.3
18	1.3	1.3	1.3	1.4	1.3	1.3	1.8	2.2	2.4	1.6	1.3
19	1.2	....	1.3	1.4	1.3	1.3	1.9	2.1	2.3	1.6	1.3
20	1.2	....	1.3	1.4	1.3	1.2	2.0	2.0	2.2	1.5	1.3
21	1.2	....	1.2	1.4	1.2	1.2	1.8	2.0	2.2	1.5	1.3
22	1.3	....	1.2	1.7	1.3	1.3	1.9	2.0	2.2	1.6	1.3
23	1.3	....	1.3	1.9	1.9	1.3	2.0	2.0	2.1	1.4	1.3
24	1.3	....	1.3	1.3	1.2	1.3	2.1	2.2	2.1	1.4	1.3
25	1.3	....	1.3	1.3	1.2	2.0	2.4	2.1	2.1	1.6	1.3
26	1.2	....	1.3	1.3	1.2	2.0	2.5	2.1	2.0	1.4	....
27	1.2	1.4	1.3	1.3	1.2	1.3	2.4	2.1	2.0	1.4	....
28	1.2	1.4	1.3	1.3	1.5	1.7	2.2	2.2	2.0	1.4	....
29	1.2	1.4	1.3	1.6	....	1.8	2.3	2.1	2.0	1.4	....
30	1.2	1.4	1.3	1.4	....	2.0	2.2	2.3	1.9	1.4	....
31	1.2	....	1.3	1.3	....	2.2	....	2.5	....	1.4	....

NOTE.—Gage heights affected by ice in creek Jan. 14 to 17, 22, 23, 29, Feb. 15, 23, 28, and Mar. 1, 2, 1911.

Daily discharge, in second-feet, of North Fork of Atanum Creek near Tampico, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1	23	23	40	23	31	23	120	197	411	103	31
2	23	23	40	23	31	23	110	232	411	103	22
3	40	23	40	23	31	23	100	169	361	103	22
4	40	23	40	31	23	23	90	197	361	84	22
5	31	23	40	31	31	23	87	169	315	84	22
6	31	23	31	31	31	23	87	197	232	84	22
7	31	23	31	31	31	23	87	169	272	84	22
8	31	23	31	31	31	23	90	169	232	68	22
9	31	23	31	31	31	23	90	146	272	68	22
10	31	31	23	31	31	23	90	125	197	54	22
11	23	40	31	23	31	23	125	125	197	54	22
12	31	31	31	23	31	23	106	125	272	54	22
13	31	31	31	23	31	23	125	125	197	54	22
14	31	31	31	28	31	31	125	106	197	54	22
15	31	31	31	31	31	31	90	106	197	54	22
16	31	31	31	34	31	125	125	125	232	54	22
17	31	31	31	37	31	125	90	146	197	54	22
18	31	31	31	40	31	31	90	169	232	54	22
19	23	33	31	40	31	31	106	146	197	54	22
20	23	33	31	40	31	23	125	125	169	42	22
21	23	31	23	40	23	23	90	125	169	42	22
22	31	28	23	37	31	31	106	125	169	54	22
23	31	70	31	34	27	31	125	125	145	31	22
24	31	62	31	31	23	31	146	169	145	31	22
25	31	54	31	31	23	125	232	146	145	54	22
26	23	40	31	31	23	125	272	146	123	31	....
27	23	40	31	31	23	31	232	146	123	31	....
28	23	40	31	31	23	75	169	169	123	31	....
29	23	40	31	36	....	90	197	146	123	31	....
30	23	40	31	40	....	125	169	197	103	31	....
31	23	....	31	31	....	169	....	272	....	31	....

NOTE.—Discharge Oct. 1, 1910, to June 1, 1911, determined from a rating curve well defined below 500 second-feet. Discharge Nov. 19 to 26, 1910, computed as the difference between flow at "The Narrows" station and that of the South Fork. Discharge interpolated for days when gage heights were affected by ice and for days when no gage height was reported.

Monthly discharge of North Fork of Atanum Creek near Tampico, Wash., for the year ending Sept. 30, 1911.

[Drainage area, 66 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	40	23	28.5	0.432	0.50	1,750	B.
November	70	23	33.5	.508	.57	1,990	B.
December	40	23	31.7	.480	.55	1,950	B.
January	40	23	31.6	.479	.55	1,940	C.
February	31	23	28.9	.438	.46	1,600	C.
March	169	23	50.1	.759	.88	3,080	B.
April	272	87	127	1.92	2.14	7,560	C.
May	272	106	156	2.36	2.72	9,590	B.
June	411	103	217	3.29	3.67	12,900	B.
July	103	31	56.8	.861	.99	3,490	B.
August 1-25	31	22	22.4	.339	.32	1,110	C.
The period						47,000	

ATANUM CREEK AT "THE NARROWS," NEAR TAMPICO, WASH.

Location.—In sec. 15, T. 12 N., R. 16 E., at a point locally known as "The Narrows," 3 miles below the junction of the North and South Forks, 3½ miles east of Tampico, and 18 miles west of North Yakima.

Records available.—June 25, 1908, to September 30, 1911.

Drainage area.—116 square miles.

Gage.—Vertical staff on right bank.

Channel.—Gravel and bowlders; shifting in floods.

Discharge measurements.—Made from cable at gage.

Winter flow.—Not seriously affected by ice.

Diversions.—Below all diversions in upper Atanum Valley.

Accuracy.—Results good.

Cooperation.—Expense of maintenance borne by United States Office of Indian Affairs.

Discharge measurements of Atanum Creek at "The Narrows," near Tampico, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1911.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Mar. 6	Howard Kimble	0.55	30.3	Apr. 5	F. B. Storey	1.07	99
7	F. B. Storey	.68	41.9	June 5	do	1.67	241
Apr. 5	do	1.08	102				

Daily gage height, in feet, of Atanum Creek at "The Narrows," near Tampico, Wash., for the year ending Sept. 30, 1911.

[J. H. Reed, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.43	0.35	0.70	....	0.55	0.72	1.30	1.20	1.90	1.05	0.55	0.40
2	....	.35	.70	....	.60	.67	....	1.25	2.10	....	.55	.40
3	.46	.35	.75	0.60	.60	.62	1.20	1.25	2.00	1.00	.53	....
4	.46	.35	....	.60	.59	.67	1.10	1.30	....	....	.50	....
5	.45	.35	.70	.60	....	....	1.10	1.30	1.70	.90	.50	.75
6	.44	....	.70	.59	.59	.57	1.00	1.30	1.70	.90	....	.60
7	.43	.35	.69	.60	.55	.90	1.00	....	1.75	.90	.60	.60
8	.43	.50	.69	....	.55	.60	1.00	1.30	1.70	.85	.60	.60
9	....	.70	.69	.60	.55	.60	....	1.30	1.60	....	.55	.95
10	.43	.90	.69	.60	.55	.60	1.00	1.20	1.70	.80	.55	....
11	.40	.90	....	.55	.52	.60	1.00	1.20	....	.80	.50	.70
12	.40	.80	.60	.55	....	....	.95	1.25	3.6	.75	.50	.70
13	.39	....	.58	.50	.54	.60	.90	1.25	2.20	.70	....	.65
14	.39	.70	.58	.50	.54	.60	.90	....	2.00	.70	.50	.65
15	.39	.68	.58	....	.54	.70	.85	1.20	1.90	.70	.50	.60
16	....	.65	.57	.53	.57	.77	....	1.25	1.80	.75	.50	.60
17	.38	.60	.55	.58	.57	.85	.80	1.25	1.60	.75	.50	....
18	.38	.65	....	.60	.57	.90	.80	1.30	....	.75	.50	.60
19	.38	.68	.60	.63	....	....	.80	1.30	1.45	.75	.50	.59
20	.37	....	.65	.65	.57	1.05	.80	1.25	1.40	.70	....	.58
21	.37	.68	.68	.65	.62	1.10	.90	....	1.35	.70	.50	.55
22	.37	.65	.70	....	....	1.15	.90	1.30	1.30	.70	.50	.55
23	....	.95	.70	.67	.67	1.20	....	1.30	1.30	.70	.50	.55
24	.36	....	.68	.67	.67	1.20	1.10	1.50	1.20	.65	.50	....
25	.36	.85	....	.63	.62	1.15	1.10	1.50	....	.65	.50	.55
26	.35	.75	.68	.63	....	....	1.25	1.40	1.20	.65	.50	.55
27	.35	....	.60	.60	.62	1.05	1.20	1.40	1.20	.65	....	.55
28	.35	.70	.60	.59	.62	1.00	1.20	....	1.20	.60	.50	.55
29	.35	.70	.60	....	....	1.05	1.20	1.40	1.25	.60	.50	.55
30	....	.75	.60	.59	....	1.10	....	....	1.05	....	.50	.55
31	.35	....	.60	.55	....	1.20	....	1.70	....	.55	.45	....

Daily discharge, in second-feet, of Atanum Creek at "The Narrows," near Tampico, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	22	16	49	36	28	47	146	126	314	98	28	17
2	23	16	49	34	33	41	136	136	390	94	28	17
3	24	16	56	33	33	35	126	136	350	89	27	28
4	24	16	52	33	32	41	107	146	300	81	24	40
5	24	16	49	33	32	36	107	146	250	73	24	51
6	23	16	49	32	32	30	89	146	250	73	28	33
7	22	16	48	33	28	73	89	146	265	73	33	33
8	22	28	48	33	28	33	89	146	250	66	33	33
9	22	49	48	33	28	33	89	146	220	62	28	81
10	22	78	48	33	28	33	89	126	250	58	28	62
11	19	78	43	28	26	33	89	126	675	58	24	44
12	19	62	38	28	27	33	81	136	1,100	51	24	44
13	18	56	36	24	28	33	73	136	430	44	24	38
14	18	49	36	24	28	33	73	131	350	44	24	38
15	18	47	36	26	28	44	66	126	314	44	24	33
16	18	44	35	27	30	54	62	136	280	51	24	33
17	18	38	33	31	30	66	58	136	220	51	24	33
18	18	44	36	33	30	73	58	146	200	51	24	33
19	18	47	38	36	30	86	58	146	180	51	24	32
20	17	47	44	38	30	98	58	136	168	44	24	31
21	17	47	47	38	35	107	73	141	157	44	24	28
22	17	44	49	40	38	116	73	146	146	44	24	28
23	16	86	49	41	41	126	90	146	146	44	24	28
24	16	78	47	41	41	126	107	193	126	38	24	28
25	16	70	47	36	35	116	107	193	126	38	24	28
26	16	56	47	36	35	107	136	168	126	38	24	28
27	16	52	38	33	35	98	126	168	126	38	24	28
28	16	49	38	32	35	89	126	168	126	33	24	28
29	16	49	38	32	....	98	126	168	136	33	24	28
30	16	56	38	32	....	107	126	209	98	30	24	28
31	16	....	38	28	....	126	....	250	....	28	20	....

NOTE.—Discharge determined from two rating curves well defined between 40 and 600 second-feet.

Monthly discharge of Atanum Creek at "The Narrows," near Tampico, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	24	16	18.9	1,160	A.
November	86	16	45.5	2,710	A.
December	56	33	43.5	2,670	A.
January	41	24	32.8	2,020	B.
February	41	26	31.6	1,760	B.
March	126	30	70.0	4,300	A.
April	146	58	94.4	5,620	A.
May	250	126	152	9,350	A.
June	1,100	98	269	16,000	B.
July	98	28	53.7	3,300	A.
August	33	20	25.2	1,550	B.
September	81	17	34.5	2,050	B.
The year	1,100	16	72.5	52,500	

ATANUM CREEK NEAR YAKIMA, WASH.

Location.—At the Northern Pacific Railway bridge near the intersection of secs. 7, 8, 17, and 18, T. 12 N., R. 19 E., 500 feet above the mouth, and 1 mile southeast of Yakima.

Records available.—May 11 to December 30, 1904; August 27, 1907, to October 31, 1910; April 1 to September 30, 1911.

Drainage area.—212 square miles.

Gage.—Vertical staff.

Channel.—Rocks and gravel; shifting in floods.

Discharge measurements.—Made from railroad bridge or by wading.

Diversions.—Below all diversions in Atanum Valley.

Cooperation.—Expense of maintenance borne by United States Office of Indian Affairs.

Estimates withheld for further data.

Discharge measurements of Atanum Creek near Yakima, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 13	F. B. Storey	(a)	9.2	May 3	F. B. Storey	.73	24.6
16	Henshaw and Storey	(a)	8.6	29	.....do	1.49	150
				July 25	.....do	.42	9.3
1911.				Sept. 25	R. K. Ray	.37	8.9
Apr. 7	F. B. Storey	1.31	81.2				

[a] No gage.

Daily gage height, in feet, of Atanum Creek near Yakima, Wash., for the year ending Sept. 30, 1911.

[James W. Campbell, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Day.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.5	0.8	1.5	1.1	......	0.35	16	1.1	.9	1.8	.40	.35	.35
2	1.5	.7	1.6	1.0	......	.30	17	1.1	.9	1.7	.40	.35	.35
3	1.5	.8	1.7	.9	......	.30	18	1.1	1.1	1.6	.20	.30	.35
4	1.5	.8	1.7	.9	......	.35	19	1.1	1.1	1.5	.35	.30	.35
5	1.5	.9	1.7	.8	......	.35	20	.9	1.1	1.5	.35	.30	.35
6	1.4	.9	1.5	.8	0.32	.40	21	.9	1.1	1.4	.25	.35	.35
7	1.4	.9	1.4	.8	.40	.35	22	.9	1.1	1.3	.45	.35	.35
8	1.4	.9	1.4	.6	.40	.40	23	.8	1.1	1.3	.45	.35	.35
9	1.3	.9	1.4	.5	.40	.40	24	.8	1.1	1.3	.32	.35	.30
10	1.3	.9	1.4	.5	.40	.35	25	.8	1.6	1.2	.32	.35	.35
11	1.3	.9	1.4	.5	.40	.40	26	.7	1.6	1.2	.32	.35	.30
12	1.3	.9	1.5	.5	.32	.35	27	.7	1.6	1.2	.32	.35	.30
13	1.3	.9	1.5	.5	.35	.35	28	.8	1.5	1.2	.32	.35	.30
14	1.2	.9	2.2	.4	.35	.35	29	.8	1.5	1.2	.32	.35	.35
15	1.2	.9	1.9	.4	.35	.35	30	.8	1.5	1.1	.32	.30	.35
							31	......	1.5	......	......	.30	......

SOUTH FORK OF ATANUM CREEK NEAR TAMPICO, WASH.

Location.—In sec. 24, T. 12 N., R. 15 E., at Shannafelt's ranch, 2 miles above Tampico and 2½ miles above the junction with the North Fork of Atanum Creek.

Records available.—August 27, 1907, to September 30, 1911.

Drainage area.—28 square miles.

Gage.—Vertical staff on right bank.

Channel.—Gravel and sand; somewhat shifting.

Discharge measurements.—Made from a private bridge one-fourth mile below gage, or by wading.

Winter flow.—Not seriously affected by ice.

Diversions.—Above all important diversions.

Accuracy.—Results fair.

Cooperation.—Expense of maintenance borne by United States Office of Indian Affairs.

Discharge measurements of South Fork of Atanum Creek near Tampico, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
1911.		*Feet.*	*Sec.-ft.*
Mar. 7	Kimble and Storey	2.55	6.9
Apr. 4	F. B. Storey	2.88	25.7
June 5	.....do	3.33	45.4

Daily gage height, in feet, of South Fork of Atanum Creek near Tampico, Wash., for the year ending Sept. 30, 1911.

[E. A. Shannafelt, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.35	2.50	2.65	2.55	2.60	2.60	3.20	2.92	3.50	2.88	2.60	2.58
2	2.36	2.50	2.65	2.55	2.60	2.60	3.20	2.95	3.44	2.85	2.60	2.56
3	2.35	2.50	2.65	2.55	2.60	2.60	......	2.98	3.50	2.82	2.60	2.52
4	2.34	2.50	2.63	2.55	2.60	2.60	2.88	2.98	3.50	2.80	2.60	2.80
5	2.34	2.50	2.63	2.55	2.60	2.60	2.85	3.00	3.45	2.78	2.60	2.75
6	2.34	2.50	2.60	2.57	2.60	2.55	2.80	3.00	3.45	2.75	2.60	2.74
7	2.35	2.51	2.60	2.60	2.60	2.58	2.80	2.98	3.45	2.74	2.60	2.74
8	2.35	2.52	2.60	2.60	2.60	2.58	2.82	2.95	3.45	2.72	2.60	2.70
9	2.35	2.55	2.60	2.60	2.60	2.60	2.80	2.95	3.45	2.72	2.60	2.90
10	2.34	2.50	2.60	2.60	2.60	2.55	2.80	2.92	3.48	2.70	2.60	2.88
11	2.34	2.50	2.60	2.60	2.60	2.60	2.80	2.90	3.46	2.70	2.60	2.88
12	2.45	2.52	2.60	2.58	2.60	2.60	2.75	2.95	3.50	2.72	2.60	2.75
13	2.40	2.55	2.60	2.58	2.60	2.80	2.72	2.92	4.10	2.70	2.60	2.72
14	2.40	2.50	2.58	2.58	2.60	2.65	2.70	2.90	4.00	2.70	2.60	2.72
15	2.45	2.55	2.60	......	2.60	2.70	2.70	2.88	3.50	2.70	2.60	2.72
16	2.45	2.55	2.60	......	2.60	2.80	2.70	2.90	3.40	2.70	2.60	2.70
17	2.48	2.55	2.60	......	2.60	2.80	2.70	2.95	3.30	2.70	2.60	2.70
18	2.47	2.55	2.60	......	2.60	2.90	2.70	3.00	3.22	2.70	2.60	2.70
19	2.48	2.55	2.60	......	2.60	3.00	2.70	2.95	3.20	2.68	2.60	2.70
20	2.48	2.56	2.60	2.60	2.60	3.10	2.72	2.95	3.10	2.68	2.60	2.70
21	2.48	2.60	2.55	2.60	2.60	3.10	2.75	2.95	3.08	2.68	2.60	2.70
22	2.47	2.60	2.55	......	2.60	3.20	2.80	2.95	3.05	2.65	2.60	2.70
23	2.48	2.60	2.55	......	2.58	3.30	2.85	3.00	3.02	2.62	2.60	2.70
24	2.48	2.60	2.55	......	2.58	3.30	2.90	3.10	3.02	2.62	2.60	2.70
25	2.48	2.60	2.55	2.60	2.58	3.35	2.95	3.20	3.00	2.60	2.60	2.70
26	2.50	2.60	2.55	2.60	2.57	3.40	3.00	3.20	3.00	2.60	2.60	2.70
27	2.50	2.65	2.60	2.60	2.58	3.30	2.90	3.20	2.98	2.60	2.60	2.70
28	2.50	2.65	2.60	2.60	2.60	3.30	2.90	3.22	2.95	2.60	2.60	2.70
29	2.50	2.65	2.55	2.60	......	3.20	2.90	3.23	2.92	2.60	2.60	2.70
30	2.50	2.65	2.55	2.60	......	3.20	2.92	3.25	2.90	2.60	2.60	2.70
31	2.50	......	2.55	2.60	......	3.20	......	3.30	......	2.60	2.60	......

Daily discharge, in second-feet, of South Fork of Atanum Creek near Tampico, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	5.6	5.1	11	6.9	8.7	8.7	45	25	58	19	5.8	1.1
2	5.2	5.1	11	6.9	8.7	8.7	45	26	53	18	5.7	.8
3	4.8	5.1	11	6.9	8.7	8.7	36	27	58	16	5.5	.3
4	4.4	5.1	10	6.9	8.7	8.7	26	27	58	15	5.4	7.8
5	4.0	5.1	10	6.9	8.7	8.7	24	28	54	14	5.2	6.0
6	3.6	5.1	8.7	7.6	8.7	6.9	21	28	54	13	5.1	5.6
7	3.2	5.5	8.7	8.7	8.7	8.0	21	26	54	12	4.9	5.6
8	2.8	5.8	8.7	8.7	8.7	8.0	22	25	54	12	4.8	4.2
9	2.4	6.9	8.7	8.7	8.7	8.7	21	25	54	12	4.6	12
10	2.0	5.1	8.7	8.7	8.7	6.9	21	23	56	11	4.5	11
11	1.6	5.1	8.7	8.7	8.7	8.7	20	22	55	11	4.3	11
12	3.7	5.8	8.7	8.0	8.7	8.7	18	24	58	12	4.2	6.0
13	2.3	6.9	8.7	8.0	8.7	18	17	22	113	11	4.0	4.9
14	2.3	5.1	8.0	8.0	8.7	11	16	21	103	11	3.9	4.9
15	3.7	6.9	8.7	8.1	8.7	13	16	19	58	11	3.7	4.9
16	3.7	6.9	8.7	8.2	8.7	18	16	20	50	11	3.6	4.2
17	4.5	6.9	8.7	8.3	8.7	18	15	24	43	11	3.4	4.2
18	4.3	6.9	8.7	8.4	8.7	23	15	26	38	11	3.3	4.2
19	4.5	6.9	8.7	8.6	8.7	28	15	23	37	9.9	3.1	4.2
20	4.5	7.3	8.7	8.7	8.7	35	16	23	31	9.9	3.0	4.2
21	4.5	8.7	6.9	8.7	8.7	35	17	22	30	9.9	2.8	4.2
22	4.3	8.7	6.9	8.7	8.7	42	19	22	28	8.8	2.7	4.2
23	4.5	8.7	6.9	8.7	8.0	49	21	25	26	7.6	2.5	4.2
24	4.5	8.7	6.9	8.7	8.0	50	24	31	26	7.6	2.4	4.2
25	4.5	8.7	6.9	8.7	8.0	54	26	37	25	6.8	2.2	4.2
26	5.1	8.7	6.9	8.7	7.6	57	29	37	25	6.7	2.1	4.2
27	5.1	11	8.7	8.7	8.0	51	23	37	24	6.6	1.9	4.2
28	5.1	11	8.7	8.7	8.7	52	23	38	22	6.4	1.8	4.2
29	5.1	11	6.9	8.7	......	44	23	39	21	6.3	1.6	4.2
30	5.1	11	6.9	8.7	......	44	24	40	20	6.1	1.5	4.2
31	5.1	......	6.9	8.7	......	45	......	43	......	6.0	1.4	......

NOTE.—Discharge determined from several poorly defined rating curves. Discharge figures for Oct. 1 to Dec. 31, 1910, supersede those published in Water-Supply Paper 292, page 217.

Monthly discharge of South Fork of Atanum Creek near Tampico, Wash., for the year ending Sept. 30, 1911.

[Drainage area, 28 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	5.6	1.6	4.06	0.145	0.17	250	C.
November	11	5.1	7.16	.256	.29	426	C.
December	11	6.9	8.46	.302	.35	520	C.
January	8.7	6.9	8.25	.295	.34	507	C.
February	8.7	7.6	8.56	.306	.32	475	C.
March	57	6.9	25.4	.907	1.05	1,560	B.
April	45	15	22.5	.804	.90	1,340	B.
May	43	19	27.6	.986	1.14	1,700	C.
June	113	20	46.2	1.65	1.84	2,750	B.
July	19	6.0	10.6	.379	.44	652	C.
August	5.8	1.4	3.58	.128	.15	220	C.
September	12	.3	4.97	.178	.20	296	C.
The year	113	.3	14.8	.529	7.19	10,700	

TOPPENISH CREEK NEAR FORT SIMCOE, WASH.

Location.—In sec. 26, T. 10 N., R. 16 E., about 1 mile below the Fort Simcoe-Goldendale highway bridge, 3½ miles southeast of Fort Simcoe.

Records available.—February 27, 1909, to September 30, 1911.

Drainage area.—135 square miles.

Gage.—Cantilever chain.

Channel.—Rough and rocky; shifting in floods.

Discharge measurements.—Made from a cable 8 feet above the gage or by wading.

Winter flow.—Not seriously affected by ice.

Accuracy.—Results fair.

Cooperation.—Expense of maintenance borne by United States Office of Indian Affairs.

Discharge measurements of Toppenish Creek near Fort Simcoe, Wash., for the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1911.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Mar. 9	Howard Kimble	1.22	64.8	June 8	Howard Kimble	1.60	111
Apr. 6	F. B. Storey	2.10	189	Aug. 11	R. K. Ray	.75	14.7
May 18	do	2.17	212				

Daily gage height, in feet, of Toppenish Creek near Fort Simcoe, Wash., for the year ending Sept. 30, 1911.

[B. B. Olney, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	0.79	1.00	0.95	1.02	0.78	2.85	2.25	2.15	1.04	0.77	......
2	......	.81	1.00	.92	1.04	.83	......	2.20	2.05	......	.77	0.72
3	0.75	.83	1.02	.90	1.05	.85	......	2.15	1.99	1.00	.78	.72
4	......	.84	1.40	.90	1.02	.98	2.50	2.40	......	.98	.77	.73
5	.75	.80	1.38	.90	1.02	.98	2.25	2.35	1.70	.95	.78	1.10
6	......	.79	1.45	.90	1.00	1.00	2.10	2.30	1.68	.94	.80	.94
7	.76	.84	1.43	.90	.98	1.03	2.05	2.15	1.60	.95	.80	.85
8	......	.89	1.40	.92	.98	1.10	2.00	2.20	1.52	.94	.80	.82
9	.80	.89	1.38	1.00	1.00	1.22	......	......	1.50	......	.79	......
10	.80	.98	1.30	.95	1.00	1.40	......	......	1.49	.90	.80	.83
11	......	1.04	1.30	.98	1.02	1.34	......	......	1.42	.88	.78	.85
12	.80	1.00	1.26	.95	.98	1.38	2.05	......	1.37	.85	.76	.84
13	......	.92	1.20	.90	.94	1.48	2.00	1.99	1.32	.82	.75	.80
14	.80	.90	1.20	.88	.90	1.72	1.85	......	1.28	.80	.77	.77
15	.76	.89	1.10	.88	.80	1.86	1.85	......	1.25	......	.78	.78
16	.76	.85	1.10	.88	.80	2.10	1.82	1.80	1.23	......	.76	.79
17	.75	.85	1.05	.86	.90	2.20	1.87	2.05	1.22	.80	.75	.78
18	.75	.84	1.00	.95	.92	......	1.92	2.20	1.20	.80	.76	.75
19	.75	.84	.98	1.11	.90	2.25	1.89	2.10	1.17	......	.76	.74
20	.75	.86	.95	1.00	.85	2.40	1.94	2.00	1.15	.80	.75	.72
21	......	1.00	.95	.98	.90	2.55	2.05	2.00	1.12	.80	.75	.73
22	.74	1.30	.96	1.00	.92	2.60	2.05	1.86	1.10	.81	......	.73
23	.74	1.20	.95	.98	.90	2.70	2.15	1.90	......	.80	74	.74
24	.74	1.10	.95	1.04	.88	2.80	2.50	2.20	1.14	.79	......	.74
25	.74	1.00	1.00	1.00	.92	2.60	2.70	2.50	......	.79	.73	.74
26	.74	.98	.98	1.00	.90	2.55	2.60	2.30	......	.77	......	.75
27	.75	1.00	.95	1.04	.79	2.40	2.50	2.55	1.10	.78	......	.76
28	.75	1.00	.98	1.02	.81	2.10	2.35	2.60	1.10	.77	.73	.75
29	.77	.98	.96	1.00	......	2.20	2.30	2.50	1.08	.77	.72	.74
30	.76	.00	.98	.98	......	2.35	2.25	2.30	1.05	.76	......	.75
31	.77	......	.95	1.00	......	2.90	......	2.20	......	.77	.72	......

Daily discharge, in second-feet, of Toppenish Creek near Fort Simcoe, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	24	26	45	40	47	25	394	232	209	38	16	13
2	23	28	45	38	49	30	361	220	188	36	16	13
3	23	30	47	36	50	32	327	209	176	34	17	13
4	23	31	93	36	47	43	294	268	149	32	16	14
5	23	27	90	36	47	43	232	256	122	30	17	44
6	24	26	100	36	45	45	198	244	119	29	18	29
7	24	31	98	36	43	48	188	209	106	30	18	22
8	26	35	93	38	43	56	178	220	95	29	18	19
9	27	35	90	45	45	69	180	210	92	27	17	20
10	27	43	79	40	45	93	183	202	91	25	18	20
11	27	49	79	43	47	85	186	194	81	24	17	22
12	27	45	74	40	43	90	188	186	74	22	16	21
13	27	38	67	36	40	105	178	176	68	19	15	18
14	27	36	67	34	36	144	149	164	64	18	16	16
15	24	35	56	34	27	171	151	152	60	18	17	17
16	24	32	56	34	27	225	144	140	58	18	16	17
17	23	32	50	32	36	248	153	188	56	18	15	17
18	23	31	45	40	38	254	162	220	54	18	16	15
19	23	31	43	57	36	261	156	198	51	18	16	14
20	23	32	40	45	32	301	166	178	49	18	15	13
21	22	45	40	43	36	343	188	178	46	18	15	14
22	22	79	42	45	38	358	188	151	44	19	14	14
23	22	67	40	43	36	388	209	158	46	18	14	14
24	22	56	40	49	34	418	294	220	48	17	14	14
25	22	45	45	45	38	358	348	294	47	17	14	14
26	22	43	43	45	36	343	320	244	45	16	14	15
27	23	45	40	49	26	301	294	307	44	17	14	16
28	23	45	43	47	28	225	256	320	44	16	14	15
29	25	43	41	45	......	248	244	294	42	16	13	14
30	24	45	43	43	......	288	232	244	39	16	13	15
31	25	......	40	45	......	450	......	220	......	16	13	......

NOTE.—Discharge Oct. 1, 1910, to Mar. 31, 1911, determined from a rating curve fairly well defined below 700 second-feet. Discharge Apr. 1 to Sept. 30, 1911, determined from a fairly well defined rating curve. Discharge interpolated for days when no gage height was reported.

Monthly discharge of Toppenish Creek near Fort Simcoe, Wash., for the year ending Sept. 30, 1911.

[Drainage area, 135 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	27	22	24.0	0.178	0.21	1,480	C.
November	79	26	39.5	.293	.33	2,350	C.
December	100	40	58.5	.433	.50	3,600	B.
January	57	32	41.1	.304	.35	2,530	B.
February	50	26	39.1	.290	.30	2,170	B.
March	450	25	196	1.45	1.67	12,100	B.
April	394	144	225	1.67	1.86	13,400	B.
May	320	140	216	1.60	1.84	13,300	B.
June	209	39	80.2	.594	.66	4,770	B.
July	38	16	22.2	.164	.19	1,360	B.
August	18	13	15.5	.115	.13	953	B.
September	44	13	17.4	.129	.14	1,040	B.
The year	450	13	81.5	.604	8.18	59,100	

TOPPENISH CREEK NEAR WHITE SWAN, WASH.

Location.—In sec. 7, T. 19 N., R. 18 E., 1,000 feet below Simcoe Creek, 8 miles east of White Swan, and about 12 miles southwest of Wapato.

Records available.—March 10, 1909, to September 30, 1911; fragmentary.

Drainage area.—416 square miles.

Gage.—Cantilever chain on left bank.

Channel.—Gravel and sand; somewhat shifting.

Discharge measurements.—Made from cable 200 feet below gage.

Winter flow.—Not seriously affected by ice.

Accuracy.—Results fair.

Cooperation.—Expense of maintenance borne by United States Office of Indian Affairs.

Discharge measurements of Toppenish Creek near White Swan, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 12	F. B. Storey	1.45	8.8	Apr. 7	F. B. Storey	5.80	224
				May 19	.....do	5.54	222
1911.				June 9	Howard Kimble	4.37	130
Mar. 8	F. B. Storey	2.67	51.0	Aug. 11	R. K. Ray	1.67	15.6

Daily gage height, in feet, of Toppenish Creek near White Swan, Wash., for the year ending Sept. 30, 1911.

[Chas. W. Macy, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.5	1.5	1.65	2.0	2.3	2.55	7.8	6.2	6.1	2.75	1.75	1.50
2	1.5	1.5	1.65	2.0	2.3	2.55	8.2	6.2	5.8	2.7	1.75	1.50
3	1.5	1.5	1.65	2.0	2.3	2.55	8.0	6.2	5.6	2.7	1.75	1.50
4	1.5	1.5	1.7	2.0	2.3	6.55	7.4	6.2	5.3	2.6	1.70	1.50
5	1.5	1.5	1.7	2.0	2.35	2.55	6.9	6.2	5.1	2.5	1.70	1.50
6	1.5	1.5	1.7	2.0	2.35	2.55	6.2	6.2	4.8	2.45	1.65	1.50
7	1.5	1.5	1.7	2.0	2.4	2.55	5.8	6.2	4.7	2.35	1.65	1.50
8	1.5	1.5	1.7	2.0	2.4	2.65	5.8	6.4	4.4	2.3	1.60	1.50
9	1.5	1.5	1.7	2.0	2.4	2.65	5.7	6.1	4.2	2.25	1.60	1.50
10	1.5	1.5	1.7	2.0	2.4	2.7	5.7	5.6	4.0	2.2	1.67	1.50
11	1.5	1.5	1.7	2.0	2.45	2.7	5.6	5.6	4.0	2.1	1.67	1.50
12	1.5	1.5	1.7	2.0	2.45	2.7	5.4	5.4	4.0	2.1	1.67	1.50
13	1.5	1.5	1.75	2.0	2.45	2.7	5.4	5.3	4.3	2.0	1.67	1.50
14	1.5	1.5	1.75	2.0	2.45	2.7	5.4	5.4	4.2	2.0	1.65	1.50
15	1.5	1.5	1.8	2.0	2.5	2.8	5.3	5.4	4.0	1.95	1.65	1.50
16	1.5	1.5	1.8	2.0	2.5	3.0	5.3	5.4	3.9	1.95	1.65	1.50
17	1.5	1.5	1.85	2.05	2.5	3.4	5.3	5.4	3.8	1.95	1.60	1.50
18	1.5	1.5	1.85	2.05	2.5	3.6	5.2	5.4	3.7	1.90	1.60	1.55
19	1.5	1.5	1.9	2.1	2.5	3.9	5.0	5.6	3.5	1.90	1.55	1.55
20	1.5	1.5	1.9	2.1	2.5	4.8	5.0	5.6	3.4	1.85	1.55	1.55
21	1.5	1.5	1.9	2.1	2.5	5.7	5.0	5.6	3.2	1.85	1.55	1.55
22	1.5	1.55	1.9	2.15	2.5	6.3	5.3	5.6	3.0	1.85	1.55	1.55
23	1.5	1.55	1.9	2.2	2.5	7.0	6.0	5.6	2.95	1.85	1.55	1.55
24	1.5	1.55	1.9	2.2	2.5	7.3	6.6	6.0	2.95	1.85	1.55	1.55
25	1.5	1.55	1.9	2.2	2.5	7.0	6.9	6.7	2.95	1.80	1.50	1.55
26	1.5	1.55	1.9	2.2	2.5	6.5	7.0	6.5	2.95	1.80	1.50	1.55
27	1.5	1.6	1.9	2.2	2.5	6.0	7.0	6.8	2.95	1.80	1.50	1.55
28	1.5	1.6	1.9	2.2	2.5	5.6	6.7	7.1	2.85	1.80	1.50	1.60
29	1.6	1.6	1.9	2.2	....	5.6	6.4	7.0	2.85	1.75	1.50	1.60
30	1.5	1.6	2.0	2.2	....	5.9	6.3	6.8	2.85	1.75	1.50	1.60
31	1.5	....	2.0	2.2	....	7.0	....	6.5	....	1.75	1.50	....

Daily discharge, in second-feet, of Toppenish Creek near White Swan, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	11	11	18	26	36	46	364	252	245	54	18	11
2	11	11	18	26	36	46	392	252	224	52	18	11
3	11	11	18	26	36	46	378	252	210	52	18	11
4	11	11	21	26	36	46	336	252	189	48	17	11
5	11	11	21	26	38	46	301	252	176	44	17	11
6	11	11	21	26	38	46	252	252	158	42	16	11
7	11	11	21	26	40	46	224	252	152	38	16	11
8	11	11	21	26	40	50	224	266	134	36	14	11
9	11	11	21	26	40	50	217	245	122	34	14	11
10	11	11	21	26	40	52	217	210	112	32	16	11
11	11	11	21	26	42	52	210	210	112	29	16	11
12	11	11	21	26	42	52	196	196	112	29	16	11
13	11	11	24	26	42	52	196	189	128	26	16	11
14	11	11	24	26	42	52	196	196	122	26	16	11
15	11	11	26	26	44	56	189	196	112	24	16	11
16	11	11	26	26	44	64	189	196	107	24	16	11
17	11	11	28	28	44	82	189	196	102	24	14	11
18	11	11	28	28	44	92	182	196	97	23	14	12
19	11	11	31	29	44	107	170	210	87	23	12	12
20	11	11	31	29	44	158	170	210	82	22	12	12
21	11	11	31	29	44	217	170	210	73	22	12	12
22	11	14	31	31	44	259	189	210	64	22	12	12
23	11	14	31	32	44	308	238	210	62	22	12	12
24	11	14	31	32	44	329	280	238	62	22	12	12
25	11	14	31	32	44	308	301	287	62	20	11	12
26	11	14	31	32	44	273	308	273	62	20	11	12
27	11	16	31	32	44	238	308	294	62	20	11	12
28	11	16	31	32	44	210	287	315	58	20	11	14
29	11	16	31	32	....	210	266	308	58	18	11	14
30	11	16	36	32	....	231	259	204	58	18	11	14
31	11	....	36	32	....	308	....	273	....	18	11	....

NOTE.—Discharge determined from two fairly well-defined rating curves.

Monthly discharge of Toppenish Creek near White Swan, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	11	11	11.0	676	B.
November	16	11	12.2	726	B.
December	36	18	26.2	1,610	B.
January	32	26	28.3	1,740	B.
February	44	36	41.6	2,310	A.
March	329	46	133	8,180	A.
April	392	170	247	14,700	B.
May	315	189	238	14,600	B.
June	245	58	113	6,720	A.
July	54	18	29.2	1,800	B.
August	18	11	14.1	867	B.
September	14	11	11.6	690	B.
The year	392	11	75.9	54,600	

TOPPENISH CREEK AT ALFALFA, WASH.

Location.—In sec. 32, T. 10 N., R. 21 E., at a highway bridge 300 feet above the Northern Pacific Railway crossing, half a mile east of Alfalfa, 2½ miles above the mouth, and 3 miles below the point where Wanita Slough, a by-channel of Yakima River, discharges into Toppenish Creek.

Records available.—March 6, 1909, to September 30, 1911.

Drainage area.—560 square miles.

Gage.—Vertical staff attached to bridge.

Channel.—Rocks and gravel; shifting in floods.

Discharge measurements.—Made from highway bridge at gage.

Winter flow.—Not seriously affected by ice.

Diversions.—Below all diversions.

Accuracy.—Results fair.

Cooperation.—Expense of maintenance borne by United States Office of Indian Affairs.

Discharge measurements of Toppenish Creek at Alfalfa, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
1911.		*Feet.*	*Sec.-ft.*
May 16	F. B. Storey	1.93	345
Aug. 23	.....do	1.03	84.3
23	.....do	1.03	86.4
Sept. 26	.....do	1.57	178

Daily gage height, in feet, of Toppenish Creek at Alfalfa, Wash., for the year ending Sept. 30, 1911.

[Mrs. Stuart Shepperd, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.9	0.9	1.7	1.4	1.4	1.5	1.4	1.7	2.0	1.5	1.1	1.0
2	.8	.9	1.6	1.4	1.4	1.4	1.5	1.8	2.0	1.5	1.1	1.0
3	.8	.9	1.6	1.4	1.4	1.4	1.6	1.8	2.0	1.5	1.1	1.0
4	.8	1.0	1.6	1.4	1.4	1.4	1.7	1.9	1.9	1.4	1.1	1.1
5	.9	1.0	1.7	1.4	1.4	1.4	1.8	1.9	2.0	1.4	1.1	1.2
6	.9	.9	1.6	1.4	1.4	1.4	1.8	1.9	2.1	1.4	1.1	1.2
7	.9	.8	1.6	1.4	1.4	1.4	1.8	1.8	2.0	1.4	1.1	1.2
8	.9	.9	1.6	1.4	1.5	1.4	1.8	1.8	2.0	1.4	1.0	......
9	.9	.8	1.5	1.4	1.5	1.4	1.8	1.8	2.0	1.3	1.0	1.2
10	.9	.8	1.5	1.4	1.4	1.4	1.9	1.7	2.0	1.3	1.0	......
11	.9	.9	1.5	1.4	1.4	1.4	1.9	1.8	1.9	1.3	1.0	......
12	.9	.9	1.5	1.4	1.4	1.4	1.9	1.8	1.8	1.2	1.0	......
13	.8	.9	1.4	1.4	1.4	1.4	1.8	1.8	1.8	1.2	1.0	......
14	.9	.9	1.5	1.4	1.4	1.5	1.8	1.9	1.8	1.2	1.0	......
15	.9	.9	1.5	1.4	1.4	1.5	1.8	1.9	1.9	1.2	1.0	......
16	.9	1.0	1.5	1.4	1.5	1.4	1.8	1.8	1.9	1.1	1.0	......
17	.9	1.1	1.5	1.3	1.5	1.4	1.8	1.8	1.9	1.1	1.0	......
18	.9	1.2	1.5	1.4	1.5	1.4	1.8	1.8	1.8	1.1	1.0	......
19	.8	1.3	1.5	1.3	1.4	1.4	1.8	1.8	1.8	1.1	1.0	......
20	.9	1.2	1.5	1.3	1.4	1.5	1.9	1.8	1.8	1.1	1.0	......
21	.8	1.3	1.5	1.3	1.4	1.5	1.9	1.9	1.7	1.1	1.0	......
22	.9	1.4	1.5	1.4	1.4	1.6	1.9	1.9	1.7	1.1	1.0	......
23	.9	1.4	1.5	1.4	1.5	1.7	1.8	1.9	1.7	1.1	1.0	......
24	.9	1.5	1.5	1.5	1.5	1.8	1.7	2.0	1.7	1.1	1.0	......
25	.9	1.6	1.5	1.4	1.5	1.9	1.7	2.1	1.6	1.1	1.0	......
26	.9	1.6	1.5	1.4	1.4	1.8	1.8	2.2	1.6	1.1	1.0	......
27	.8	1.7	1.4	1.4	1.5	1.8	1.8	2.1	1.6	1.1	.9	......
28	.9	1.7	1.4	1.4	1.5	1.7	1.8	2.1	1.5	1.1	.9	......
29	.9	1.8	1.4	1.4	......	1.6	1.8	2.0	1.5	1.1	.9	......
30	.9	1.8	1.4	1.4	......	1.5	1.7	2.0	1.5	1.1	.9	......
31	.9	......	1.4	1.4	......	1.4	......	2.0	......	1.1	.9	......

NOTE.—Gage heights Sept. 10 to 30, 1911, believed to be unreliable and are omitted.

Daily discharge, in second-feet, of Toppenish Creek at Alfalfa, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	86	86	270	184	184	210	184	270	307	162	94	81
2	72	86	238	184	184	184	210	304	307	162	94	81
3	72	86	238	184	184	184	238	304	307	162	94	81
4	72	103	238	184	184	184	270	340	272	142	94	94
5	86	103	270	184	184	184	304	340	307	142	94	108
6	86	86	238	184	184	184	304	340	344	142	94	108
7	86	72	238	184	184	184	304	304	307	142	94	108
8	86	86	238	184	210	184	304	304	307	142	81	108
9	86	72	210	184	210	184	304	304	307	124	81	108
10	86	72	210	184	184	184	340	270	307	124	81	......
11	86	86	210	184	184	184	340	304	272	124	81	......
12	86	86	210	184	184	184	340	304	240	108	81	......
13	72	86	184	184	184	184	304	304	240	108	81	......
14	86	86	210	184	184	210	304	340	240	108	81	......
15	86	86	210	184	184	210	304	340	272	108	81	......
16	86	103	210	184	210	184	304	304	272	94	81	......
17	86	120	210	160	210	184	304	304	272	94	81	......
18	86	139	210	184	210	184	304	304	240	94	81	......
19	72	160	210	160	184	184	304	304	240	94	81	......
20	86	139	210	160	184	210	340	304	240	94	81	......
21	72	160	210	160	184	210	340	340	211	94	81	......
22	86	184	210	184	184	238	340	340	211	94	81	......
23	86	184	210	184	210	270	304	340	211	94	81	......
24	86	210	210	210	210	304	270	380	211	94	81	......
25	86	238	210	184	210	340	270	420	185	94	81	......
26	86	238	210	184	184	304	304	460	185	94	81	......
27	72	270	184	184	210	304	304	344	185	94	69	......
28	86	270	184	184	210	270	304	344	162	94	69	......
29	86	304	184	184	......	238	304	307	162	94	69	......
30	86	304	184	184	......	210	270	307	162	94	69	......
31	86	......	184	184	......	184	......	307	......	94	69	......

NOTE.—Discharge Oct. 1, 1910, to May 26, 1911, determined from a rating curve well defined between 50 and 1,500 second-feet. Discharge May 27 to Sept. 30, 1911, determined from a rating curve well defined between 60 and 300 second-feet. Discharge Sept. 8, 1911, interpolated. Discharge Sept. 10 to 30, 1911, estimated at 90 second-feet per day.

Monthly discharge of Toppenish Creek at Alfalfa, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	86	72	82.8	5,090	B.
November	304	72	144	8,570	B.
December	270	184	214	13,200	B.
January	210	160	182	11,200	B.
February	210	184	193	10,700	B.
March	340	184	215	13,200	B.
April	340	184	297	17,700	B.
May	460	270	325	20,000	B.
June	344	162	249	14,800	B.
July	162	94	113	6,950	B.
August	94	69	82.0	5,040	B.
September	108	....	92.2	5,490	D.
The year	460	....	182	132,000	

SIMCOE CREEK NEAR FORT SIMCOE, WASH.

Location.—In sec. 34, T. 11 N., R. 16 E., at a proposed reservoir site 4 miles northeast of Fort Simcoe.

Records available.—February 28, 1909, to September 30, 1911.

Drainage area.—80 square miles.

Gage.—Vertical staff since March, 1910; prior to that date a standard chain gage at same location.

Channel.—Sand and gravel; somewhat shifting.

Discharge measurements.—Made from a foot log, or by wading near the gage.

Winter flow.—Not seriously affected by ice.

Accuracy.—Results fair.

Cooperation.—Expense of maintenance borne by United States Office of Indian Affairs.

Discharge measurements of Simcoe Creek near Fort Simcoe, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1911.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Mar. 9	F. B. Storey	1.51	11.4	June 8	Howard Kimble	1.78	26.7
Apr. 7	.....do	1.93	39.8	Aug. 10	R. K. Ray	1.13	2.5
May 18	.....do	1.98	41.9				

Daily gage height, in feet, of Simcoe Creek near Fort Simcoe, Wash., for the year ending Sept. 30, 1911.

[Parchese Wolloock, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.0	1.2	1.3	1.3	1.3	1.4	2.2	2.0	2.1	1.4	1.2	1.1
2	1.0	1.2	1.3	1.3	1.4	1.4	2.2	2.0	2.1	1.4	1.2	1.1
3	1.1	1.2	1.3	1.3	1.4	1.4	2.2	2.0	2.1	1.4	1.2	1.1
4	1.1	1.2	1.3	1.3	1.4	1.4	2.2	2.0	2.0	1.3	1.2	1.1
5	1.1	1.2	1.4	1.3	1.4	1.4	2.2	2.0	......	1.3	1.2	1.1
6	1.1	1.2	1.4	1.3	1.4	1.4	......	2.0	......	1.3	1.2	1.1
7	1.1	1.2	1.4	1.3	1.4	1.4	......	2.0	......	1.3	1.2	1.1
8	1.1	1.3	1.4	1.3	1.4	1.4	......	2.0	......	1.3	1.2	1.1
9	1.1	1.3	1.4	1.3	1.4	1.5	2.1	2.0	1.7	1.3	1.2	1.1
10	1.1	1.3	1.4	1.3	1.4	1.5	2.0	2.0	1.7	1.3	1.2	1.1
11	1.1	1.3	1.4	1.3	1.4	1.5	2.0	2.0	1.6	1.3	1.2	1.1
12	1.1	1.3	1.4	1.3	1.4	1.5	1.9	2.0	1.6	1.3	1.2	1.1
13	1.1	1.3	1.4	1.3	1.4	1.5	1.9	2.0	2.4	1.3	......	1.1
14	1.1	1.3	1.4	1.3	1.4	1.5	1.8	2.0	2.4	......	......	1.1
15	1.1	1.3	1.4	1.3	1.4	1.6	1.8	2.0	2.0	......	1.2	1.1
16	1.1	1.3	1.4	1.3	1.4	1.6	1.8	2.0	1.9	......	1.2	1.1
17	1.1	1.3	1.4	1.3	1.4	1.8	1.8	1.9	1.7	......	1.2	......
18	1.2	1.3	1.4	......	1.4	1.8	1.8	1.9	......	1.2	1.2	......
19	1.2	1.3	1.4	......	1.4	1.9	1.8	1.9	......	1.2	1.2	......
20	1.2	1.3	1.3	1.3	1.4	1.9	1.8	1.9	......	1.2	1.1	......
21	1.2	1.3	1.3	......	1.4	1.9	1.9	1.9	......	1.2	1.1	1.1
22	1.2	1.3	1.3	1.3	1.4	2.2	1.9	1.9	......	1.2	1.1	1.1
23	1.2	1.3	1.3	1.3	1.4	2.2	1.9	1.9	......	......	1.1	1.1
24	1.2	1.3	1.3	1.3	1.4	2.1	1.9	2.0	......	......	1.1	1.1
25	1.2	1.3	1.3	1.3	1.4	2.0	1.9	2.1	......	1.2	1.1	......
26	1.2	1.3	1.3	1.3	1.4	2.0	2.0	2.1	......	1.2	1.1	......
27	1.2	1.3	1.3	1.3	1.4	2.0	2.0	2.1	......	1.2	1.1	......
28	1.2	1.3	1.3	1.3	1.4	2.0	2.0	......	......	1.2	1.1	......
29	1.2	1.3	1.3	1.3	......	2.0	2.0	2.1	1.4	1.2	1.1	......
30	1.2	1.3	1.3	1.3	......	2.1	2.0	......	1.4	1.2	1.1	......
31	1.2	......	1.3	1.3	......	2.2	......	2.1	......	1.2	1.1	......

NOTE.—Gage heights June 18 to 28, 1911, omitted as they are believed to be unreliable.

Daily discharge, in second-feet, of Simcoe Creek near Fort Simcoe, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.2	4	8	4	4	7	63	44	53	7	2	1
2	0.2	4	8	4	7	7	63	44	53	7	2	1
3	1	4	8	4	7	7	63	44	53	7	2	1
4	1	4	8	4	7	7	63	44	44	4	2	1
5	1	4	13	4	7	7	63	44	40	4	2	1
6	1	4	13	4	7	7	60	44	35	4	2	1
7	1	4	13	4	7	7	58	44	30	4	2	1
8	1	8	13	4	7	7	56	44	25	4	2	1
9	1	8	13	4	7	11	53	44	21	4	2	1
10	1	8	13	4	7	11	44	44	21	4	2	1
11	1	8	13	4	7	11	44	44	15	4	2	1
12	1	8	13	4	7	11	36	44	15	4	2	1
13	1	8	13	4	7	11	36	44	86	4	2	1
14	1	8	13	4	7	11	28	44	86	4	2	1
15	1	8	13	4	7	15	28	44	44	3	2	1
16	1	8	13	4	7	15	28	44	36	3	2	1
17	1	8	13	4	7	28	28	36	21	2	2	1
18	4	8	13	4	7	28	28	36	19	2	2	1
19	4	8	13	4	7	36	28	36	18	2	2	1
20	4	8	8	4	7	36	28	36	17	2	1	1
21	4	8	8	4	7	36	36	36	16	2	1	1
22	4	8	8	4	7	63	36	36	15	2	1	1
23	4	8	8	4	7	63	36	36	14	2	1	1
24	4	8	8	4	7	53	36	44	13	2	1	1
25	4	8	8	4	7	44	36	53	12	2	1	1
26	4	8	8	4	7	44	44	53	11	2	1	1
27	4	8	8	4	7	44	44	53	10	2	1	1
28	4	8	8	4	7	44	44	53	9	2	1	1
29	4	8	8	4	......	44	44	53	7	2	1	1
30	4	8	8	4	......	53	44	53	7	2	1	1
31	4	......	8	4	......	63	......	53	......	2	1	......

NOTE.—Discharge Oct. 1 to Dec. 31, 1910, determined from a rating curve fairly well defined below 400 second-feet. Discharge Jan. 1 to Sept. 30, 1911, determined from a rating curve well defined above 10 second-feet. Discharge interpolated for days when no gage height was reported and for June 18 to 28, 1911, when gage heights were omitted.

Monthly discharge of Simcoe Creek near Fort Simcoe, Wash., for the year ending Sept. 30, 1911.

[Drainage area, 80 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	4	0.2	2.3	0.029	0.03	141	B.
November	8	4	7.1	.089	.10	422	B.
December	13	8	10.4	.130	.15	640	B.
January	4	4	4.0	.050	.06	246	B.
February	7	4	6.9	.086	.09	383	B.
March	63	7	26.8	.335	.39	1,650	A.
April	63	28	43.3	.541	.60	2,580	A.
May	53	36	44.2	.552	.64	2,720	A.
June	86	7	28.2	.352	.39	1,680	B.
July	7	2	3.3	.041	.05	203	B.
August	2	1	1.6	.020	.02	98.4	C.
September	1	1	1.0	.012	.01	59.5	C.
The year	86	.2	14.9	.185	2.53	10,800	

SATUS CREEK NEAR TOPPENISH, WASH.

Location.—In sec. 26, T. 9 N., R. 19 E., 1,000 feet gelow the crossing of the Toppenish-Goldendale road, 1 mile above Dry Creek, 6 miles below Logy Creek, and about 11 miles southwest of Toppenish.

Records available.—November 8, 1908, to September 30, 1911.

Drainage area.—246 square miles.

Gage.—Vertical staff in two sections.

Channel.—Rock and gravel; shifting in floods.

Discharge measurements.—Made from a cable 150 feet below the gage or by wading.

Winter flow.—Not seriously affected by ice.

Diversions.—Entire low-water flow used for irrigation above the station.

Accuracy.—Results rather poor on account of lack of gage readings.

Cooperation.—Expense of maintenance borne by United States Office of Indian Affairs.

The following discharge measurement was made by F. B. Storey: March 10, 1911: Gage height, 1.32 feet; discharge, 102 second-feet.

Daily gage height, in feet, of Satus Creek near Toppenish, Wash., for the year ending Sept. 30, 1911.

[H. L. Jensen, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1				1.1								
2	0.8						2.0			1.0		
3												0.7
4			1.7						1.6			
5					1.3	1.1						
6		0.9									1.0	
7								1.7				
8				1.1								
9	.8						1.6					
10						1.32				.9		.9
11			1.6						1.5			
12					1.2	1.3						
13		1.0									.9	
14								1.5				
15				1.0								
16	.85						1.6			.9		
17												.9
18			1.2						1.2			
19					1.1	2.0						
20		1.0									.9	
21												
22	.9			1.5		2.2	1.5	1.7				
23							1.4			.7		
24												.9
25			1.3						1.2			
26					1.0	2.0						
27		1.3									.6	
28								1.6				
29				1.2								
30	.9						1.6			.8		
31												

Daily discharge, in second-feet, of Satus Creek near Toppenish, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	25	36	141	64	86	56	350	150	140	32	19	9
2	25	36	165	64	89	58	262	160	140	29	21	10
3	25	36	165	64	92	60	240	170	140	28	23	10
4	25	36	190	64	95	62	220	200	140	27	25	11
5	25	36	190	64	98	64	200	190	140	26	27	12
6	25	36	190	64	95	71	180	180	140	25	29	13
7	25	36	190	64	92	78	160	167	140	24	27	15
8	25	36	190	64	89	86	150	159	135	23	26	17
9	25	36	165	62	86	94	140	151	130	22	25	19
10	25	36	165	60	84	102	140	143	120	21	24	21
11	25	49	165	58	82	100	140	136	115	21	23	21
12	25	49	165	56	80	98	140	129	110	21	22	21
13	25	49	165	54	77	123	140	122	100	21	21	21
14	25	49	119	52	74	148	140	115	90	21	21	21
15	25	49	119	49	72	173	140	137	80	21	21	21
16	30	49	80	49	70	199	140	160	70	21	21	21
17	36	49	80	49	68	225	140	180	60	19	21	21
18	36	49	80	49	66	251	140	200	55	17	21	21
19	36	49	80	60	64	277	135	190	55	15	21	21
20	36	49	80	80	62	300	130	182	55	13	21	21
21	36	64	80	115	60	322	125	174	55	12	19	21
22	36	64	80	141	58	345	115	167	55	11	17	21
23	36	80	80	130	56	380	92	163	55	10	15	21
24	36	80	80	120	54	400	150	159	55	10	13	21
25	36	98	98	100	52	350	240	155	55	11	11	21
26	36	98	98	90	49	262	300	150	51	12	9	21
27	36	98	98	80	52	240	260	145	47	13	7	21
28	36	119	98	80	54	220	220	140	43	14	7	21
29	36	119	98	80		240	180	140	39	15	8	21
30	36	119	98	82		280	140	140	35	15	8	21
31	36		98	84		400		140		17	9	

NOTE.—Discharge Oct. 1, 1910, to Mar. 22, 1911, determined from a rating curve fairly well defined below 700 second-feet. Discharge Mar. 23 to Sept. 30, 1911, determined from a fairly well-defined rating curve. Discharge for days when no gage height was reported determined by comparisons with stations on Toppenish Creek.

Monthly discharge of Satus Creek near Toppenish, Wash., for the year ending Sept. 30, 1911.

[Drainage area, 246 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	36	25	30.5	0.124	0.14	1,880	C.
November	119	36	59.6	.242	.27	3,550	C.
December	190	80	125	.508	.59	7,690	C.
January	141	49	73.9	.300	.35	4,540	C.
February	98	49	73.4	.298	.31	4,080	C.
March	400	56	196	.797	.92	12,100	D.
April	350	92	175	.711	.79	10,400	D.
May	200	115	158	.642	.74	9,720	C.
June	140	35	88.2	.359	.40	5,250	C.
July	32	10	18.9	.077	.09	1,160	C.
August	29	7	18.8	.076	.09	1,160	C.
September	21	9	18.6	.076	.08	1,110	C.
The year	400	7	86.4	.351	4.77	62,600	

Summary of monthly run-off, in acre-feet, of canals in Yakima Valley for 1911.

Diversions from Yakima River.

Canal.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Total.
Kittitas Valley:								
Cascade	3,350	5,100	5,030	5,060	5,230	2,590	812	27,200
West Kittitas	2,080	4,960	4,560	5,230	6,040	4,310	3,820	31,000
Ellensburg	3,640	6,520	7,080	7,010	6,520	1,860	....	32,600
Olson [a]	716	1,010	2,530	1,760	1,210	336	179	7,740
Bull [b]	1,010	1,840	2,380	2,150	2,150	347	0	9,880
Fogarty [b]	119	289	446	430	320	220	123	1,950
	10,900	19 700	22,000	21,600	21,500	9,660	4,930	110,000
Yakima-Moxee Valley:								
Selah Moxee	2,340	4,410	4,280	4,290	4,080	2,720	1,810	23,900
Taylor [b]	555	1,720	1,610	1,410	1,350	595	510	7,750
Moxee Co. [c]	964	1,940	1,680	1,880	2,040	1,100	664	10,300
Granger [b]	119	246	298	491	307	119	61	1,640
Fowler	1,730	3,370	3,610	4,030	3,710	1,600	658	18,700
	5,710	11,700	11,500	12,100	11,500	6,130	3,700	62,300
Indian Reservation Valley:								
New Reservation	17,900	22,500	23,400	21,700	15,100	10,100	9,390	120,000
Old Reservation	13,800	17,500	14,100	11,300	6,520	5,950	4,970	74,100
Sunnyside	37,100	47,400	45,300	47,700	51,300	42,100	39,500	310,000
	68,800	87,400	82,800	80,700	72,900	58,200	53,900	505,000
Lower Yakima Valley:								
Kiona	982	1,750	1,610	1,650	1,590	1,690	1,330	10,600
Kennewick	9,160	11,100	8,090	11,100	11,600	8,930	4,190	64,200
Lower Yakima	5,770	7,320	6,780	7,260	6,520	5,780	4,400	43,800
Amon [d]	1,440	1,830	1,700	1,820	1,630	1,440	1,100	11,000
	17,400	22,000	18,200	21,800	21,300	17,800	11,000	130,000
Total from Yakima River	103,000	141,000	134,000	136,000	127,000	91,800	73,500	807,000

[a] Intake diversion. Part wasted back to river.
[b] Estimated from miscellaneous measurements.
[c] Sum of Hubbard and Moxee canals.
[d] Estimated 25 per cent of Lower Yakima canal.

Summary of monthly run-off, in acre-feet, of canals in Yakima Valley for 1911—Contd.

Diversions from Naches River.

Canal.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Total.
Above Tieton River: Selah Valley...	3,530	6,700	6,550	7,810	8,180	6,010	2,850	41,600
Between Tieton River and Cowiche Creek:								
Wapatox [a]........................	179	1,970	2,440	2,640	3,200	1,130	123	11,700
Clarke [b]........................	268	553	506	430	430	71	61	2,320
John Cox [b]........................	119	123	119	123	123	119	61	787
Upper Scott........................	388	524	631	670	762	214	267	3,460
Lowery [b]........................	238	553	417	491	491	119	61	2,370
Kelly [b]........................	595	922	357	430	430	119	....	2,850
Fortune........................	435	670	1,000	627	1,130	343	123	4,330
Lower Scott........................	708	1,110	1,180	640	1,260	756	368	6,020
Basket Ford [b]........................	....	277	565	553	492	60	....	1,950
Naches Canal Co........................	2,230	4,000	4,360	4,060	2,830	1,540	1,810	20,800
Yakima Valley........................	192	1,990	2,960	2,750	3,010	1,070	....	12,000
McCormack & Long [b]........................	238	430	417	492	492	417	241	2,730
Chapman & Nelson [b]........................	357	430	476	553	553	417	369	3,160
Sculler & Rodenbach [b]........................	119	184	238	246	246	179	123	1,340
	6,070	13,700	15,700	14,700	15,400	6,550	3,610	75,800
Below Cowiche Creek:								
Naches Cowiche........................	638	1,530	1,580	1,920	1,890	893	600	9,050
Fruitvale Schanno........................	446	707	952	990	1,060	409	199	4,760
R. S. & C........................	126	271	408	473	536	76	66	1,960
Broadgage [b]........................	397	523	506	553	467	162	0	2,610
Union Canal Co. [c]........................	2,360	3,190	3,620	3,980	3,980	2,090	1,200	20,400
North Yakima Town........................	258	427	368	311	537	114	....	2,020
Schanno........................	1,510	1,610	1,640	1,590	1,450	317	....	8,120
	5,740	8,260	9,070	9,820	9,920	4,060	2,060	48,900
Total from Naches River........	15,300	28,700	31,300	32,300	33,500	16,600	8,520	166,000

Diversions from Tieton River.

Tieton........................	1,360	2,770	6,070	7,690	6,270	2,960	117	27,200
Grand total Yakima Valley.....	120,000	172,000	171,000	176,000	167,000	111,000	82,100	999,000

[a] Difference between Wapatox at intake and Wapatox at power house, plus Lower Wapatox canal.
[b] Estimated from miscellaneous measurements.
[c] Sum of Old Union and Naches Avenue Union canals less return of Old Union canal.

SNAKE RIVER[1] NEAR MORAN, WYO.

Location.—In sec. 17, T. 45 N., R. 114 W. sixth principal meridian, about 1½ miles below Moran post office and the United States Reclamation Service dam at the outlet to Jackson Lake.

Records available.—September 21, 1903, to September 30, 1911.

Drainage area.—820 square miles.

Gage.—Inclined staff gage on the left bank; datum unchanged.

Channel.—Gravel and bowlders. Practically permanent since 1909 and will probably continue so with the water controlled as it is.

Discharge measurements.—Made from a cable and car about 100 feet below the gage and, at low stages, by wading.

Winter flow.—Relation between gage heights and discharge not affected by ice.

Diversions and storage.—No important tributaries and no diversions between the dam and the station, and practically no diversions from the river above the lake. Storage capacity of the reservoir with the dam at its present elevation, 400,000 acre-feet.

Accuracy.—Rating curve well defined; results good.

Cooperation.—Gage heights furnished by the Reclamation Service.

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[1] Formerly called South Fork of Snake River.

Discharge measurements of Snake River near Moran, Wyo., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
July 3	J. C. Dort	5.95	6,510
3	....do	5.94	6,410
3	....do	1.44	613
4	....do	1.42	606

Daily gage height, in feet, of Snake River near Moran, Wyo., for the year ending Sept. 30, 1911.

[Maria Allen, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	......	1.05	1.0	2.3	1.55	......	1.70	4.45	6.00	7.80	3.10
2	......	......	1.05	1.35	2.3	1.55	2.5	1.75	4.45	6.00	7.80	2.90
3	......	......	1.05	1.35	2.35	1.55	2.4	1.80	5.00	5.95	7.75	2.80
4	......	......	1.0	1.35	......	......	2.25	1.85	5.10	7.60	7.75	2.75
5	......	......	1.0	......	2.45	1.55	2.0	1.90	5.25	7.05	7.72	2.65
6	......	......	......	1.35	2.2	1.5	1.95	1.95	5.50	6.40	7.32	2.60
7	......	......	......	......	2.0	......	1.95	2.05	5.50	2.75	7.10	2.55
8	......	......	......	1.35	1.95	1.5	......	2.35	5.80	3.40	6.78	2.50
9	......	......	......	......	1.9	......	1.9	2.35	6.00	5.40	6.52	2.40
10	......	......	......	1.35	1.85	1.5	1.9	2.65	6.50	5.25	2.80	2.35
11	......	......	......	......	......	......	1.85	2.80	6.50	4.8	2.55	2.30
12	......	......	1.0	1.35	1.85	1.55	......	2.95	6.75	4.3	2.00	2.25
13	......	......	1.15	1.35	......	1.55	1.7	3.45	6.85	3.85	2.00	2.20
14	......	......	1.15	1.35	1.85	1.6	1.75	3.60	7.10	3.3	1.97	2.20
15	......	......	1.25	1.4	......	1.6	......	3.75	7.35	2.65	2.00	2.20
16	......	......	1.35	1.4	1.85	1.65	1.75	4.65	7.40	2.3	2.00	2.10
17	......	......	1.5	......	1.85	1.7	1.7	4.20	7.50	2.0	2.00	2.05
18	......	......	1.55	1.45	......	......	1.7	4.20	7.60	3.35	4.1	2.00
19	......	......	1.7	1.45	1.85	1.7	1.65	4.25	7.65	3.35	5.75	1.95
20	......	......	1.6	1.45	1.85	......	1.65	4.35	7.70	3.35	5.5	1.92
21	......	......	1.45	1.5	......	1.75	1.6	4.45	7.75	3.0	5.22	1.90
22	......	......	1.3	1.55	1.85	1.6	......	3.95	7.62	......	5.05	1.86
23	......	......	1.2	1.55	......	1.5	1.6	3.95	7.05	2.6	4.72	1.85
24	......	......	1.2	1.6	1.85	1.7	......	3.95	6.40	2.8	4.55	.00
25	......	......	......	1.65	......	2.0	1.6	4.10	1.90	2.8	4.32	— .10
26	......	......	......	1.7	1.65	2.35	......	4.35	4.90	2.8	4.10	— .05
27	......	......	......	1.85	1.65	2.65	1.6	......	5.70	2.85	3.85	— .20
28	......	1.0	1.3	......	1.5	3.15	1.6	4.40	6.10	2.75	3.72	— .20
29	......	1.0	......	1.9	......	3.0	1.65	4.40	6.10	2.8	3.52	— .20
30	......	1.05	......	2.0	......	2.85	1.7	4.45	6.05	2.85	3.35	— .20
31	......	......	......	2.05	......	2.6	......	4.45	......	5.1	3.2	......

NOTE.—For days of no record during October to December the water was away from the gage and below a stage of 1 foot. The flow during this period was controlled by construction work at Jackson Lake dam. The gage was not read on days during January to September for which no record is given.

Daily discharge, in second-feet, of Snake River near Moran, Wyo., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1			425	400	1,280	702	1,530	805	4 060	6 570	9 700	2,160
2			425	582	1,280	702	1,480	840	4,060	6,570	9,700	1,910
3			425	582	1,330	702	1,380	875	4,920	6,480	9,610	1,800
4			400	582	1,380	702	1,240	912	5,080	9,350	9,610	1,740
5			400	582	1,430	702	1,030	950	5,320	8,390	9,560	1,630
6				582	1,200	670	990	990	5,740	7,250	8,860	1,580
7				582	1,030	670	990	1,070	5,740	1,740	8,480	1,530
8				582	990	670	970	1,330	6,230	2,540	7,920	1,480
9				582	950	670	950	1,330	6,570	5,570	7,460	1,380
10				582	912	670	950	1,630	7,420	5,320	1,800	1,330
11				582	912	686	912	1,800	7,420	4,600	1,530	1,280
12			400	582	912	702	858	1,970	7,860	3,830	1,030	1,240
13			475	582	912	702	805	2,610	8,040	3,160	1,030	1,200
14			475	582	912	735	840	2,810	8,480	2,410	1,010	1,200
15			525	610	912	735	840	3,020	8,910	1,630	1,030	1,200
16			580	610	912	770	840	4,370	9,000	1,280	1,030	1,110
17			670	625	912	805	805	3,680	9,180	1,030	1,090	1,070
18			705	640	912	805	805	3,680	9,350	2,480	3,530	1,090
19			810	640	912	805	770	3,760	9,440	2,480	6,150	990
20			740	640	912	822	770	3,900	9,520	2,480	5,740	966
21			640	670	912	840	735	4,060	9,610	2,030	5,270	950
22			550	702	912	735	735	3,310	9,380	1,800	5,000	920
23			500	702	912	670	735	3,310	8,390	1,580	4,480	912
24			500	735	912	805	735	3,310	7,250	1,800	4,210	77
25				770	841	1,030	735	3,530	950	1,800	3,860	66
26				805	770	1,330	735	3,900	4,760	1,800	3,530	72
27				912	770	1,630	735	3,940	6,060	1,850	3,160	56
28		400	550	931	670	2,220	735	3,980	6,740	1,740	2,980	56
29		400		950		2,030	770	3,980	6,740	1,800	2,700	56
30		425		1,030		1,850	805	4,060	6,660	1,850	2,480	56
31				1,070		1,580		4,060		5,080	2,280	

NOTE.—Discharge determined from a rating curve which is well defined between 80 and 7,400 second-feet. Discharge estimated at 60 second-feet for Oct. 1 to Nov. 27, Dec. 6 to 11, 25 to 27, and 29–31. Discharge interpolated for other days of no gage readings.

Monthly discharge of Snake River near Moran, Wyo., for the year ending Sept. 30, 1911.

[Drainage area, 820 square miles.]

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October			60	3,690	D.
November	425		94.8	5,640	D.
December	810		352	21,600	C.
January	1,070	400	678	41,700	A.
February	1,430	670	986	54,800	A.
March	2,220	670	940	57,800	A.
April	1,530	735	907	54,000	A.
May	4,370	805	2,700	166,000	A.
June	9,610	950	6,960	414,000	A.
July	9,350	1,030	3,490	215,000	A.
August	9,700	1,010	4,700	289,000	A.
September	2,160	56	1,030	61,300	A.
The year	9,610		1,910	1,380,000	

NOTE.—See footnote to daily discharge table.

SNAKE RIVER[1] NEAR LYON, IDAHO.

Location.—In sec. 3, T. 1 N., R. 43 E. Boise meridian, just below the iron highway bridge between Conant and Swan valleys, on the stage road up Snake River; about 2 miles above Lyon post office; below entrance of Buffalo Creek and Gros Ventre, John Day, and Salt rivers.

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[1] Formerly called South Fork of Snake River.

Records available.—April 18, 1903, to September 30, 1911.

Drainage area.—5,480 square miles.

Gage.—Chain gage on the left bank about 300 feet below the highway bridge used since August 25, 1909; datum 0.6 foot lower than that of old gage on the right bank. Records for 1909 reduced to the old datum; for records after January 1, 1910, datum of chain gage was adopted.

Channel.—Gravel; shifts.

Discharge measurements.—Made from a cable at the site of the old Wedekind's ferry, about 1 mile below the gage.

Winter flow.—Affected by ice.

Diversions and storage.—Only diversions made from river above this station are small ranch ditches. About 400,000 acre-feet can at present be stored in Jackson Lake.

Accuracy.—Estimates of daily discharge approximate for certain periods; monthly estimates probably reliable; winter records approximate.

Discharge measurements of Snake River near Lyon, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage. height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 27	J. C. Dort	4.50	7,300	July 11	J. C. Dort	7.08	15,700
May 18	O. W. Hartwell	6.92	16,700	Aug. 17	Lynn Crandall	4.06	5,140
June 1	A. B. Purton	7.85	22,200	Sept. 16	H. L. Stoner	3.72	4,530

Daily gage height, in feet, of Snake River near Lyon, Idaho, for the year ending Sept. 30, 1911.

[John E. Clark, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.7	2.7	2.75	......	......	2.6	3.3	4.4	7.8	8.4	5.0	4.4
2	2.7	2.65	2.7	2.5	......	2.6	......	4.5	8.5	......	6.9	4.3
3	2.7	2.65	2.7	6.7	3.1	2.7	3.4	4.5	8.3	7.9	6.9	......
4	2.8	2.65	......	7.2	2.9	2.7	3.5	4.9	......	7.7	6.9	4.1
5	2.7	2.65	2.7	5.4	......	......	3.6	5.5	8.3	7.2	6.9	4.1
6	2.7	......	2.7	5.2	2.9	2.7	3.5	6.2	8.8	7.0	......	4.2
7	2.7	2.65	2.65	4.0	2.8	2.7	3.4	......	8.9	7.2	6.7	4.2
8	2.7	2.65	2.65	......	2.8	2.7	3.2	6.0	9.3	7.5	6.5	4.1
9	......	2.7	2.7	2.9	2.8	2.7	......	6.5	9.6	......	6.4	4.0
10	2.7	2.7	2.7	2.7	2.7	2.8	3.4	6.0	9.3	7.2	6.3	......
11	2.7	2.7	......	2.7	2.7	2.8	3.3	5.7	......	7.1	4.7	4.0
12	2.7	2.7	2.7	2.6	......	......	3.3	5.7	9.6	6.8	4.5	3.8
13	2.7	......	2.7	2.6	2.7	2.7	3.2	6.1	10.2	6.4	......	3.8
14	2.7	2.65	2.65	2.6	2.7	2.7	3.1	......	10.3	6.3	4.2	3.7
15	2.7	2.65	2.65	......	2.7	2.6	3.0	6.8	10.5	6.3	4.1	3.7
16	......	2.65	2.65	2.6	2.7	2.6	......	7.1	10.7	......	4.1	3.75
17	2.85	2.65	2.65	2.6	2.7	2.6	3.1	6.8	10.8	6.0	4.1	......
18	2.85	2.65	......	2.7	2.7	2.6	3.2	6.9	......	5.9	4.05	3.7
19	2.85	2.65	2.6	2.7	......	......	3.2	6.5	10.7	5.9	5.2	3.7
20	2.8	......	2.6	2.7	2.6	2.6	3.3	6.2	10.6	5.9	......	3.65
21	2.8	2.7	2.55	2.7	2.6	2.6	3.4	......	10.7	5.8	5.6	3.65
22	2.8	2.75	2.55	......	2.6	2.7	3.3	6.0	10.6	5.6	5.5	3.7
23	......	2.8	2.5	2.7	2.6	2.7	......	6.0	10.4	......	5.4	3.7
24	2.65	2.9	2.5	4.3	2.6	2.7	3.5	6.5	10.1	5.5	5.2	......
25	2.7	2.8	......	7.2	2.6	2.7	3.9	7.2	......	5.4	5.0	3.4
26	2.7	2.8	2.5	8.2	......	......	4.3	7.4	8.1	5.4	4.9	3.4
27	2.7	......	2.55	8.2	2.6	2.8	4.5	7.3	7.6	5.4	......	3.3
28	2.7	2.7	2.55	8.2	2.6	2.8	4.9	......	8.7	5.3	4.9	3.35
29	2.7	2.8	2.55	......	......	2.9	4.8	6.8	8.6	5.2	4.8	3.3
30	......	2.75	2.5	......	......	2.9	......	6.9	8.5	......	4.7	3.3
31	2.7	......	2.5	......	......	3.1	......	7.1	......	5.1	4.5	......

NOTE.—Gage heights affected by ice gorges Jan. 1 to 7, 24 to 31, and Feb. 1 to 2. Mush ice was reported floating in the stream Feb. 6 to 28, but apparently did not affect the gage heights.

Daily discharge, in second-feet, of Snake River near Lyon, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2,660	2,660	2,760	....	4,500	2,460	3,990	6,990	21,400	22,900	7,750	6,340
2	2,660	2,560	2,660	....	4,300	2,460	4,110	7,300	25,100	21,600	15,300	6,050
3	2,660	2,560	2,660	....	3,520	2,660	4,230	7,300	23,900	20,200	15,300	5,780
4	2,870	2,560	2,660	....	3,080	2,660	4,480	8,640	23,800	19,100	15,300	5,500
5	2,660	2,560	2,660	....	3,080	2,660	4,730	10,900	23,800	16,600	15,400	5,500
6	2,660	2,560	2,660	....	3,080	2,660	4,480	13,800	26,500	15,600	15,000	5,780
7	2,660	2,560	2,560	....	2,870	2,660	4,230	13,400	27,000	16,500	14,500	5,780
8	2,660	2,560	2,660	....	2,870	2,660	3,750	12,900	29,100	17,900	13,600	5,500
9	2,660	2,660	2,660	....	2,870	2,660	3,990	15,100	30,700	17,100	13,200	5,220
10	2,660	2,660	2,660	2,660	2,660	2,870	4,230	12,900	29,100	16,300	12,800	5,220
11	2,660	2,660	2,660	2,660	2,660	2,870	3,990	11,700	29,800	15,800	6,920	5,220
12	2,660	2,660	2,660	2,460	2,660	2,760	3,990	11,700	30,600	14,400	6,340	4,690
13	2,660	2,610	2,660	2,460	2,660	2,660	3,750	13,300	33,900	12,800	5,920	4,690
14	2,660	2,560	2,560	2,460	2,660	2,660	3,520	14,900	34,400	12,400	5,500	4,440
15	2,660	2,560	2,560	2,460	2,660	2,460	3,300	16,500	35,500	12,400	5,270	4,440
16	2,820	2,560	2,560	2,460	2,660	2,460	3,410	17,900	36,600	11,800	5,270	4,560
17	2,980	2,560	2,560	2,460	2,660	2,460	3,520	15,600	37,100	11,200	5,270	4,500
18	2,980	2,560	2,510	2,660	2,660	2,460	3,750	17,000	36,800	10,700	5,150	4,440
19	2,980	2,560	2,460	2,660	2,560	2,460	3,750	15,100	36,400	10,800	8,680	4,440
20	2,870	2,610	2,460	2,660	2,460	2,460	3,990	13,800	35,800	10,800	9,440	4,320
21	2,870	2,660	2,360	2,660	2,460	2,460	4,230	13,400	36,300	10,500	10,200	4,320
22	2,870	2,760	2,360	2,660	2,460	2,660	3,990	12,900	35,600	9,710	9,750	4,440
23	2,720	2,870	2,260	2,660	2,460	2,660	4,240	12,900	34,400	9,520	9,200	4,440
24	2,560	3,080	2,260	2,660	2,460	2,660	4,480	15,100	32,600	9,370	8,750	4,090
25	2,660	2,870	2,260	2,660	2,460	2,660	5,540	18,400	27,000	9,010	8,080	3,740
26	2,660	2,870	2,260	....	2,460	2,760	6,690	19,400	21,500	9,040	7,780	3,740
27	2,660	2,760	2,360	....	2,460	2,870	7,300	18,900	19,000	9,060	7,790	3,510
28	2,660	2,660	2,360	....	2,460	2,870	8,640	17,700	24,600	8,720	7,800	3,620
29	2,660	2,870	2,360	....	....	3,080	8,280	16,500	24,000	8,400	7,500	3,510
30	2,660	2,760	2,260	....	....	3,080	7,640	17,000	23,400	8,240	7,150	3,510
31	2,660	....	2,260	....	....	3,520	....	17,900	....	8,080	6,590	....

NOTE.—Discharge determined from two fairly well defined curves applicable Oct. 1 to June 1 and Sept. 4 to 30. Indirect method for shifting channels used June 2 to Sept. 3. Mean discharge estimated Jan. 1 to 9 at 2,500 second-feet, and Jan. 26 to 31 at 3,150 second-feet. Discharge estimated Jan. 24 to 25 and Feb. 1 to 2 as given. Discharges interpolated for days of no gage height except as noted above.

Monthly discharge of Snake River near Lyon, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	2,980	2,560	2,720	167,000	A.
November	3,080	2,560	2,670	159,000	B.
December	2,760	2,260	2,500	154,000	B.
January	....	....	2,670	164,000	C.
February	....	2,460	2,810	156,000	B.
March	3,520	2,460	2,690	165,000	A.
April	8,640	3,300	4,670	278,000	A.
May	19,400	6,990	14,100	867,000	A.
June	37,100	19,000	29,500	1,760,000	B.
July	22,900	8,080	13,100	806,000	B.
August	15,400	5,150	9,440	580,000	B.
September	6,340	3,510	4,710	280,000	A.
The year	37,100	....	7,630	5,540,000	

SNAKE RIVER[1] NEAR HEISE, IDAHO.

Location.—In sec. 5, T. 3 N., R. 41 E., Boise meridian, about 600 feet above the Anderson dam, a crib and stone diversion structure, about 3 miles above Heise and about 25 miles below the Lyon station. Several small creeks enter between the Lyon and Heise stations.

Records available.—September 25, 1910, to September 30, 1911.

Drainage area.—Not measured.

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[1] Formerly called South Fork of Snake River.

Gage.—Vertical staff on left bank.

Channel.—Channel under the cable shifts; relation of gage height to discharge controlled by Anderson dam. This relation has been affected at times by repair work on the dam and damage to the crest by high water and ice.

Discharge measurements.—Made from a cable about 100 feet below the gage.

Winter flow.—Affected by ice.

Diversion and storage.—Station is above all the main diversions from Snake River. A small ditch diverts water around the station, but its maximum capacity is probably not 20 second-feet. The only water stored above the station is at Jackson Lake, Wyo., where the Reclamation Service dam can at present store abont 400,000 acre-feet.

Accuracy.—Records impaired by ice gorges in the winter and by damage to the crest of the dam by ice and floods.

Discharge measurements of Snake River near Heise, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 27	J. C. Dort	3.75	7,980	July 10	J. C. Dort	6.18	17,300
28	.....do	4.08	9,210	12	.....do	5.81	15,000
May 17	O. W. Hartwell	6.40	17,800	Aug. 16	Lynn Crandall	2.92	5,420
31	A. B. Purton	6.54	19,000	Sept. 15[a]	H. L. Stoner	2.62	4,380
June 2	.....do	7.94	25,000				

[a] Relation of gage height to discharge affected by repair work at Anderson dam.

Daily gage height, in feet, of Snake River near Heise, Idaho, for the year ending Sept. 30, 1911.

[Parley Byington, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.5	2.0	1.8	1.9	2.6	1.6	2.4	3.8	7.4	7.7	3.9	3.05
2	1.6	2.0	1.75	1.7	2.5	1.6	2.9	3.8	8.0	7.4	5.45	3.06
3	1.6	2.0	1.8	1.6	2.0	1.6	2.9	3.9	7.8	7.15	5.92	2.95
4	1.8	2.0	1.9	1.8	1.8	1.6	2.85	4.15	8.1	6.35	5.92	2.95
5	1.8	2.0	1.8	1.7	2.0	1.6	2.7	4.65	8.2	5.85	5.92	2.9
6	1.85	2.0	1.75	1.6	2.0	1.6	2.65	5.55	8.4	6.05	5.75	2.9
7	1.9	1.9	1.65	1.6	2.1	1.6	2.4	5.3	8.6	6.15	5.6	2.9
8	2.0	1.8	1.65	1.7	2.1	1.6	2.4	5.45	8.8	6.75	5.45	2.8
9	2.0	1.7	1.7	1.7	2.0	1.6	2.35	5.95	9.1	6.75	5.25	2.8
10	2.1	1.7	1.7	1.7	1.9	1.6	2.45	5.55	8.5	6.2	5.05	2.7
11	2.1	1.7	1.65	1.6	1.8	1.6	2.4	4.85	8.5	5.85	3.5	2.7
12	2.1	1.7	1.65	1.5	1.75	1.6	2.4	5.05	9.1	5.45	3.35	2.7
13	2.2	1.7	1.65	1.5	1.75	1.5	2.3	5.5	9.7	5.25	3.2	2.6
14	2.2	1.7	1.65	1.5	1.7	1.5	2.2	6.05	10.1	5.25	3.05	2.65
15	2.2	1.7	1.7	1.5	1.7	1.6	2.1	6.45	10.1	5.15	3.0	2.65
16	2.2	1.7	1.7	1.5	1.7	1.6	2.1	6.65	10.35	4.95	2.9	2.65
17	2.2	1.7	1.7	1.6	1.7	1.6	2.15	6.35	10.35	4.95	2.9	2.6
18	2.25	1.7	1.8	1.5	1.75	1.6	2.2	6.45	10.3	4.65	2.88	2.6
19	2.2	1.7	1.8	1.5	1.75	1.6	2.3	6.05	10.2	4.85	3.3	2.6
20	2.15	1.7	1.8	1.6	1.7	1.6	2.4	5.65	10.2	4.75	4.4	2.7
21	2.1	1.7	1.8	1.6	1.7	1.7	2.6	5.45	10.3	4.6	4.3	2.8
22	2.1	1.7	1.9	1.6	1.7	1.7	2.6	5.45	10.2	4.5	4.15	2.8
23	2.1	1.7	2.0	1.6	1.7	1.8	2.6	5.65	9.8	4.5	4.0	2.9
24	2.1	1.8	1.9	1.6	1.6	1.9	2.7	6.05	9.3	4.3	3.9	2.8
25	2.1	1.9	1.9	1.6	1.6	1.9	3.1	6.55	8.5	4.2	3.7	2.65
26	2.1	1.9	2.0	1.7	1.5	2.0	3.6	6.95	6.95	4.2	3.6	2.5
27	2.05	1.8	2.0	1.7	1.5	2.0	3.8	6.65	7.6	4.2	3.5	2.35
28	2.05	1.8	2.0	1.6	1.6	2.05	4.1	6.25	7.8	4.2	3.4	2.1
29	2.05	1.8	2.0	1.7	......	2.05	4.0	6.35	7.8	4.2	3.3	2.1
30	2.0	1.8	2.0	1.9	......	2.05	3.9	6.45	7.7	4.0	3.2	2.1
31	2.0	......	2.1	2.6	......	2.10	......	6.65	......	3.9	3.1	......

NOTE.—Gage heights were affected by repair work on the dam below from Oct. 1 to 10, and by the removal of a temporary dam from Nov. 7 to 9. Gage heights during September were also probably affected by repair work at the dam. Jan. 1 to 2, 4 to 5, 8 to 10, and Feb. 5 to 23, affected by ice gorges.

Daily discharge, in second-feet, of Snake River near Heise, Idaho, for the year ending Sept. 30, 1911.

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1		3,170	2,860	4,720	2,860	4,280	8,040	22,400	23,700	8,360	5,820
2		3,090	2,860	4,500	2,860	5,440	8,040	25,100	22,400	14,100	5,850
3		3,170	2,860	3,520	2,860	5,440	8,360	24,200	21,300	16,100	5,560
4		3,340	2,860	3,170	2,860	5,310	9,210	25,500	17,900	16,100	5,560
5		3,170	2,860		2,860	4,940	11,000	26,000	15,800	16,100	5,440
6		3,090	2,860		2,860	4,830	14,500	26,800	16,600	15,400	5,440
7		2,930	2,860		2,860	4,280	13,500	27,800	17,000	14,800	5,440
8		2,930	2,860		2,860	4,280	14,100	28,700	19,600	14,100	5,180
9		3,010	2,860		2,860	4,180	16,200	30,100	19,600	13,300	5,180
10	3,010	3,010	2,860		2,860	4,390	14,500	27,300	17,300	12,500	4,940
11	3,010	2,930	2,860		2,860	4,280	11,800	27,300	15,800	7,090	4,940
12	3,010	2,930	2,700		2,860	4,280	12,500	30,100	14,100	6,640	4,910
13	3,010	2,930	2,700		2,700	4,080	14,300	32,900	13,300	6,220	4,720
14	3,010	2,930	2,700		2,700	3,880	16,600	34,800	13,300	5,820	4,520
15	3,010	3,010	2,700		2,860	3,700	18,300	34,800	12,900	5,690	4,330
16	3,010	3,010	2,700		2,860	3,700	19,200	36,000	12,200	5,440	4,330
17	3,010	3,010	2,860		2,860	3,790	17,900	36,000	12,200	5,440	4,220
18	3,010		2,700		2,860	3,880	18,300	35,800	11,000	5,380	4,220
19	3,010		2,700		2,860	4,080	16,600	35,300	11,800	6,500	4,220
20	3,010		2,860		2,860	4,280	15,000	35,300	11,400	10,100	4,220
21	3,010		2,860		3,010	4,720	14,100	35,800	10,800	9,740	4,220
22	3,010		2,860		3,010	4,720	14,100	35,300	10,400	9,210	4,220
23	3,010		2,860		3,170	4,720	15,000	33,400	10,400	8,700	4,440
24	3,170		2,860	2,860	3,340	4,940	16,600	31,000	9,740	8,360	4,220
25	3,340		2,860	2,860	3,340	5,950	18,700	27,300	9,380	7,720	3,900
26	3,340		3,010	2,700	3,520	7,400	20,500	20,500	9,380	7,400	3,870
27	3,170		3,010	2,700	3,520	8,040	19,200	23,300	9,380	7,090	3,830
28	3,170		2,860	2,860	3,600	9,040	17,500	24,200	9,380	6,790	3,700
29	3,170		3,010		3,600	8,700	17,900	24,200	9,380	6,500	3,700
30	3,170		3,340		3,600	8,360	18,300	23,700	8,700	6,220	3,700
31			4,720		3,700		19,200		8,360	5,950	

NOTE.—Discharge Oct. 1 to Nov. 9 estimated from study of gage heights and records at Lyon station. Nov. 10 to Dec. 17 and Jan. 1 to Sept. 13, except periods affected by ice, were determined from a well-defined curve. Mean discharge Dec. 18 to 31 estimated at 2,900 second-feet. Jan. 1 to 2, 4 to 5, 8 to 10 were estimated as given, and mean discharge for Feb. 5 to 23 was estimated at 2,900 second-feet. Indirect methods were used Sept. 14 to 30 because of repair work on the dam.

Monthly discharge of Snake River near Heise, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October			3,000	184,000	C.
November	3,340		3,060	182,000	C.
December	3,340		2,980	183,000	C.
January	4,720	2,700	2,910	179,000	C.
February	4,720		3,040	169,000	C.
March	3,700	2,700	3,040	187,000	B.
April	9,040	3,700	5,130	305,000	A.
May	20,500	8,040	15,100	928,000	A.
June	36,000	20,500	29,400	1,750,000	A.
July	23,700	8,360	13,700	842,000	A.
August	16,100	5,380	9,320	573,000	A.
September	5,850	3,700	4,630	276,000	B.
The year	36,000		7,950	5,760,000	

NOTE.—See footnote to table of daily discharge.

SNAKE RIVER NEAR BLACKFOOT, IDAHO.

Location.—In sec. 31, T. 3 S., R. 34 E. Boise meridian, about one-fourth mile below the mouth of Blackfoot River, 2 miles east of Rich post office, and about 14 miles southwest of Blackfoot; about 60 miles below the junction of Henrys Fork.

Records available.—June 6, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on right bank. Datum raised by 0.06 foot June 25, 1911.

Channel.—Channel of very coarse gravel; shifts only slightly during high water. Water in two channels except during high water.

Discharge measurements.—Made from a cable just above the gage and by wading at low stages.

Winter flow.—Slightly affected by ice.

Diversions.—Practically all normal summer flow diverted in the Idaho Falls district above station.

Accuracy.—Conditions favor accurate measurements; results reliable.

Discharge measurements of Snake River near Blackfoot, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 14	O. W. Hartwell	8.56	15,200	July 13	J. C. Dort	7.44	10,800
22	do	8.49	14,700	Sept. 3	H. L. Stoner	4.51	3,100
June 22	J. C. Dort	12.34	[a] 37,500	21	Lynn Crandall	4.50	2,880

[a] Doubtful, owing to high velocities and insufficient weight.

Daily gage height, in feet, of Snake River near Blackfoot, Idaho, for year ending Sept. 30, 1911.

[James A. Clough, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	3.56	4.62	5.00	4.60	6.00	4.40	5.14	7.12	8.53	9.94	3.15	4.69
2	3.54	4.69	4.94	4.01	6.50	4.26	5.27	7.08	9.10	10.05	3.00	4.60
3	3.56	4.70	4.94	5.10	6.10	4.45	5.55	7.13	9.50	9.88	5.04	4.53
4	3.73	4.51	4.94	6.00	5.70	4.05	5.81	7.19	9.83	9.61	5.93	4.60
5	3.80	4.70	5.02	5.57	5.51	4.60	5.80	7.38	9.96	9.00	6.06	4.61
6	4.00	4.69	5.07	4.67	5.31	5.10	5.78	7.53	10.20	8.58	6.22	4.71
7	4.05	4.70	5.00	4.60	5.30	5.10	5.70	8.65	10.35	8.25	6.30	4.84
8	4.10	4.79	4.85	4.60	5.36	5.35	5.50	8.72	10.43	8.18	6.24	4.90
9	4.11	4.80	4.82	4.84	5.80	5.50	5.31	8.78	10.61	8.40	6.08	4.92
10	4.11	4.80	4.82	4.70	5.89	5.50	5.30	9.09	10.75	8.63	5.90	4.83
11	4.21	4.80	4.91	4.43	4.55	5.40	5.31	9.08	10.70	8.16	5.75	4.75
12	4.18	4.80	4.85	4.70	4.65	5.30	5.30	8.60	10.48	7.79	5.36	4.70
13	4.20	4.80	4.89	4.45	4.90	5.40	5.30	8.49	10.57	7.40	4.07	4.65
14	4.21	4.74	4.85	4.50	5.20	5.35	5.21	8.53	11.00	6.98	3.67	4.61
15	4.30	4.75	4.80	4.44	5.00	5.32	5.12	8.64	11.58	6.81	3.31	4.65
16	4.20	4.79	4.70	4.60	4.86	5.29	4.98	9.08	11.72	6.52	3.06	4.63
17	4.35	4.71	4.42	4.65	4.70	5.25	4.95	9.41	11.82	6.22	2.80	4.62
18	4.40	4.75	4.40	4.57	4.10	5.25	4.93	9.39	12.10	5.60	2.71	4.64
19	4.47	4.80	4.80	4.34	4.25	5.11	5.09	9.43	12.20	5.63	2.69	4.70
20	4.51	4.85	4.63	4.32	4.50	5.11	5.31	9.39	12.20	5.50	2.54	4.54
21	4.46	4.89	4.32	4.02	4.54	5.90	5.51	8.85	12.30	5.24	4.64	4.50
22	4.43	4.88	4.35	4.60	4.67	5.50	5.55	8.43	12.34	5.01	4.90	4.49
23	4.38	4.90	4.50	4.54	4.69	5.11	5.60	8.22	12.30	4.69	4.83	4.50
24	4.34	4.98	4.68	4.25	4.50	5.11	5.45	8.19	12.30	4.52	4.88	4.60
25	4.39	4.99	4.70	4.45	4.30	5.10	5.44	8.39	12.10	4.27	4.83	4.63
26	4.32	5.02	4.80	4.72	4.20	5.20	5.69	8.73	11.35	4.05	4.90	4.50
27	4.32	5.02	4.50	4.97	4.33	5.30	6.20	9.00	10.03	3.95	4.81	4.35
28	4.39	5.02	4.10	4.71	4.44	5.20	6.59	9.30	9.35	3.74	4.85	4.30
29	4.39	4.98	4.40	4.84	......	5.19	6.85	8.97	9.63	3.65	4.89	4.26
30	4.45	4.95	4.51	5.20	......	5.01	7.16	8.55	9.80	3.38	4.92	4.21
31	4.49	......	4.20	5.61	......	5.05	......	8.33	......	3.25	4.80	......

NOTE.—Gage heights June 25 to Sept. 30 are referred to a datum 0.06 foot higher than that previously used. Slush ice floating in the river Dec. 26 to 31. Discharge relation affected by ice Feb. 9 to 13 and possibly Jan. 2 to 5 also.

Daily discharge, in second-feet, of Snake River near Blackfoot, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1,590	3,070	3,740	3,040	5,870	2,720	4,000	9,310	14,800	21,400	1,200	3,290
2	1,570	3,190	3,630	2,140	7,270	2,510	4,250	9,170	17,300	21,900	1,040	3,140
3	1,590	3,210	3,630	3,920	6,130	2,800	4,820	9,340	19,100	21,100	3,930	3,020
4	1,790	2,900	3,630	5,870	5,150	2,200	5,400	9,560	20,600	19,900	5,880	3,140
5	1,880	3,210	3,780	4,870	4,740	3,040	5,380	10,200	21,200	17,100	6,210	3,160
6	2,130	3,190	3,870	3,160	4,330	3,920	5,330	10,800	22,400	15,300	6,640	3,330
7	2,200	3,210	3,740	3,040	4,310	3,920	5,150	15,300	23,100	13,900	6,860	3,560
8	2,270	3,360	3,470	3,040	4,430	4,410	4,910	15,600	23,500	13,600	6,690	3,660
9	2,280	3,380	3,420	3,450	4,300	4,720	4,330	15,900	24,300	14,500	6,260	3,700
10	2,280	3,380	3,420	3,210	4,300	4,720	4,310	17,200	25,000	15,500	5,800	3,530
11	2,440	3,380	3,580	2,770	4,300	4,510	4,330	17,200	24,800	13,500	5,440	3,400
12	2,390	3,380	3,470	3,210	4,300	4,310	4,310	15,100	23,700	12,100	4,570	3,310
13	2,420	3,380	3,540	2,800	4,300	4,510	4,310	14,700	24,100	10,600	2,320	3,220
14	2,440	3,280	3,470	2,880	4,110	4,410	4,130	14,800	26,200	9,030	1,790	3,160
15	2,570	3,300	3,380	2,780	3,740	4,350	3,960	15,300	29,100	8,440	1,370	3,220
16	2,420	3,360	3,210	3,040	3,490	4,290	3,700	17,200	29,800	7,510	1,100	3,190
17	2,640	3,230	2,750	3,120	3,210	4,210	3,650	18,700	30,300	6,640	845	3,170
18	2,720	3,300	2,720	2,990	2,270	4,210	3,610	18,600	31,700	5,090	764	3,210
19	2,830	3,380	3,380	2,630	2,500	3,940	3,900	18,800	32,200	5,160	747	3,310
20	2,900	3,470	3,090	2,600	2,880	3,940	4,330	18,600	32,200	4,870	625	3,040
21	2,820	3,540	2,600	2,160	2,940	5.620	4,740	16,200	32,700	4,320	3,210	2,980
22	2,770	3,520	2,640	3,040	3,160	4,720	4,820	14,400	32,900	3,870	3,660	2,960
23	2,690	3,560	2,880	2,940	3,190	3,940	4,930	13,600	32,700	3,290	3,530	2,980
24	2,630	3,700	3,180	2,500	2,880	3,940	4,620	13,400	32,700	3,010	3,620	3,140
25	2,700	3,720	3,210	2,800	2,570	3,920	4,590	14,200	32,000	2,620	3,530	3,190
26	2,600	3,780	3,380	3,240	2,420	4,110	5,130	15,700	28,200	2,300	3,660	2,980
27	2,600	3,780	2,880	3,690	2,620	4,310	6,400	16,800	21,800	2,160	3,500	2,740
28	2,700	3,780	2,270	3,230	2,780	4,110	7,550	18,200	18,700	1,880	3,570	2,660
29	2,700	3,700	2,720	3,450	....	4,090	8,380	16,700	20,000	1,770	3,640	2,600
30	2,800	3,650	2,900	4,110	....	3,760	9,450	14,900	20,800	1,450	3,700	2,520
31	2,860	....	2,420	4,950	....	3,830	....	14,000	....	1,300	3,480	....

NOTE.—Discharge determined from well-defined rating tables. Discharge estimated Feb. 9 to 13.

Monthly discharge of Snake River near Blackfoot, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	2,900	1,570	2,430	149,000	A.
November	3,780	2,900	3,410	203,000	A.
December	3,870	2,270	3,230	199,000	A.
January	5,870	2,140	3,250	200,000	A.
February	7,270	2,270	3,870	215,000	A.
March	5,620	2,200	4,000	246,000	A.
April	9,450	3,610	4,960	295,000	A.
May	18,800	9,170	14,800	910,000	A.
June	32,900	14,800	25,600	1,520,000	A.
July	21,900	1,300	9,200	566,000	A.
August	6,860	625	3,520	216,000	A.
September	3,700	2,520	3,150	187,000	A.
The year	32,900	625	6,780	4,910,000	

SNAKE RIVER AT NEELEY, IDAHO.

Location.—In sec. 11, T. 8 S., R. 30 E. Boise meridian, half a mile north of Neeley post office, 4 miles southwest of American Falls, and about 32 miles above the Minidoka dam. Portneuf and Bannock rivers and about 2,500 second-feet of spring water enter between the Blackfoot gaging station and Neeley. Raft River enters below the station and above the Minidoka dam.

Records available.—March 17, 1906, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Friez automatic gage installed August 8, 1910, on the left bank at the site of the staff gage previously used; datum unchanged.

Channel.—Solid lava rock; control permanent.

Discharge measurements.—Made from a cable about 6 feet above the gage. A cable installed a short distance above by a private company can be used as a stay wire in high water.

Winter flow.—Relation between gage height and discharge somewhat affected by ice.

Diversions.—No diversions of importance are made between the Blackfoot station and Neeley.

Accuracy.—Conditions good; results reliable.

Cooperation.—Expense of maintenance borne by the United States Reclamation Service.

Discharge measurements of Snake River at Neeley, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
July 8	J. C. Dort	7.96	16,500	Aug. 2	O. W. Hartwell	4.33	3,540
20	Lynn Crandall	5.78	7,530	2	.....do	4.33	3,520
31	O. W. Hartwell	4.46	3,910	3	.....do	4.30	3,580
31	.....do	4.45	3,800	3	.....do	4.28	3,430
Aug. 1	.....do	4.40	3,820	30	.....do	5.25	6,090
1	.....do	4.40	3,780				

Daily gage height, in feet, of Snake River at Neeley, Idaho, for the year ending Sept. 30, 1911.

[J. J. Sorenson, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	4.66	5.09	5.30	......	6.81	5.09	5.61	7.09	8.22	9.62	4.40	5.20
2	......	5.13	5.33	......	7.09	5.02	5.66	7.12	8.34	9.71	4.30	5.13
3	......	5.18	5.32	......	......	4.95	5.73	7.08	8.85	9.77	4.29	5.08
4	......	5.18	5.37	......	......	5.16	5.90	7.06	9.38	9.67	4.97	5.06
5	......	5.19	5.35	......	......	5.39	6.06	7.09	9.55	9.43	5.83	5.10
6	......	5.18	5.36	......	......	5.62	6.09	7.28	9.67	8.82	6.05	5.11
7	......	5.20	5.37	......	......	5.79	6.06	7.78	9.88	8.32	6.15	5.12
8	4.83	5.22	5.31	......	......	5.91	5.97	8.41	10.04	8.04	6.20	5.21
9	4.85	5.24	5.28	......	......	6.01	5.82	8.53	10.13	7.91	6.19	5.27
10	4.85	5.25	5.23	......	......	6.10	5.72	8.63	10.27	8.14	6.11	5.28
11	4.87	5.27	5.26	......	......	6.07	5.68	8.82	10.39	8.26	5.98	5.24
12	4.90	5.28	5.30	......	......	6.03	5.68	8.75	10.38	7.88	5.80	5.18
13	4.89	5.25	5.28	......	......	5.95	5.69	8.47	10.22	7.50	5.27	5.18
14	4.90	5.24	5.25	......	......	5.89	5.68	8.20	10.24	7.10	4.83	5.13
15	4.90	5.23	5.22	......	......	5.85	5.60	8.30	10.52	6.74	4.66	5.13
16	4.95	5.21	5.18	......	......	5.78	5.54	8.53	10.81	6.50	4.49	5.12
17	4.97	5.20	5.11	......	......	5.76	5.48	8.85	10.98	6.36	4.38	5.08
18	4.98	5.19	......	......	5.19	5.80	5.43	9.16	......	6.22	4.28	5.08
19	5.00	5.22	......	......	5.04	5.78	5.44	9.21	......	5.94	4.23	5.08
20	5.03	5.22	......	......	5.00	5.71	5.50	9.17	......	5.80	4.18	5.10
21	5.06	5.24	......	......	4.99	5.69	5.68	9.02	......	5.70	4.16	5.05
22	5.05	5.30	......	......	5.03	5.67	5.81	8.67	......	5.51	4.88	5.04
23	5.03	5.29	......	......	5.05	5.65	5.88	8.36	......	5.32	5.22	5.03
24	5.01	5.31	......	......	5.06	5.68	5.89	8.13	11.83	5.15	5.22	5.06
25	4.99	5.32	......	......	5.07	5.75	5.85	8.03	11.80	5.02	5.21	5.12
26	4.98	5.35	......	......	5.07	......	5.81	8.16	11.68	4.93	5.22	5.18
27	4.96	5.37	......	......	5.02	......	5.95	8.58	11.37	4.84	5.21	5.08
28	4.96	5.38	......	......	5.01	......	6.28	8.94	10.31	4.73.	5.22	4.99
29	4.99	5.36	......	5.97	......	......	6.60	9.04	9.36	4.63	5.23	4.97
30	5.04	5.29	......	6.17	......	......	6.96	8.78	9.48	4.55	5.27	4.95
31	5.07	......	......	6.54	......	......	......	8.40	......	4.46	5.26	......

NOTE.—Ice present in stream Dec. 18 to Jan. 28. Automatic gage not recording on days for which no gage heights are given.

Daily discharge, in second-feet, of Snake River at Neeley, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	4,350	5,570	6,220	....	11,600	5,570	7,200	12,800	17.800	25,000	3,680	5,910
2	....	5,690	6,310	....	12,800	5,360	7,370	12,900	18,400	25,500	3,540	5,690
3	....	5,850	6,280	....	11,200	5,160	7,600	12,700	21.000	25,800	3,430	5,540
4	....	5,850	6,440	....	8,250	5,790	8,180	12,600	23,800	25,300	5,210	5,480
5	....	5,880	6,380	....	7,570	6,500	8,760	12,800	24,700	24,000	7,940	5,600
6	....	5,850	6,410	....	7,370	7,240	8,870	13,600	25,300	20,900	8,720	5,630
7	....	5,910	6,440	....	7,240	7,810	8,760	15,800	26,400	18,300	9,100	5,660
8	4,810	5,970	6,250	....	7,200	8,220	8,430	18,800	27,300	17,000	9,280	5,940
9	4,870	6,030	6,160	....	7,170	8,580	7,910	19,400	27,800	16,400	9,240	6,130
10	4,870	6,060	6,000	....	7,170	8,910	7,570	19,900	28,600	17,500	8,950	6,160
11	4,930	6,130	6,100	....	7.110	8,800	7,430	20,900	29,300	18,000	8,470	6,030
12	5,010	6,160	6,220	....	6,980	8,650	7,430	20,500	29,200	16,200	7,840	5,850
13	4,980	6,060	6,160	....	6,790	8,360	7,470	19,000	28,300	14,500	6,130	5,850
14	5,010	6,030	6,060	....	6,630	8,150	7,430	17,700	28,400	12,800	4,810	5,690
15	5,010	6,000	5,970	....	6,440	8,010	7,170	18,200	30,000	11,400	4,350	5,690
16	5,160	5,940	5,850	....	6,250	7,770	6,980	19,400	31,600	10,400	3,900	5,660
17	5,210	5,910	5,630	....	6,100	7,700	6,790	21,000	32,600	9,870	3,630	5,540
18	5,240	5,880	....	....	5,880	7,840	6,630	22,600	34,500	9,350	3,410	5,540
19	5,300	5,970	....	....	5,420	7,770	6,660	22,900	36,000	8,320	3,300	5,540
20	5,390	5,970	....	....	5,300	7,530	6,850	22,700	36,300	7,840	3,190	5,600
21	5,480	6,030	....	....	5,270	7,470	7,430	21,900	36,900	7,500	3,150	5,450
22	5,450	6,220	....	....	5,390	7,400	7,870	20,100	37,600	6,880	4,950	5,420
23	5,390	6,190	....	....	5,450	7,340	8,110	18,500	37,400	6,290	5,970	5,390
24	5,330	6,250	....	....	5,480	7,430	8,150	17,400	37,300	5,760	5,970	5,480
25	5,270	6,280	....	....	5,510	7,670	8,010	16,900	37,200	5,360	5,940	5,660
26	5,240	6,380	....	....	5,510	7,870	7,870	17,600	36,500	5,100	5,970	5,850
27	5,180	6,440	....	....	5,360	7,700	8,360	19,600	34,800	4,840	5,940	5,540
28	5,180	6,470	....	....	5,330	7,600	9,580	21,500	28,800	4,540	5,970	5,270
29	5,270	6,410	....	8.430	....	7,500	10,800	22,000	23,700	4,270	6,000	5,210
30	5,420	6,190	....	9,170	....	7,400	12,200	20,700	24,300	4,060	6,130	5,160
31	5,510	....	....	10,600	....	7,300	....	18,700	....	3,830	6,100	....

NOTE.—Discharge determined from a well-defined rating curve. Mean discharge estimated as follows: Oct. 2 to 7, 4,400 second-feet; Dec. 18 to 31, 5,200 second-feet; Jan. 1 to 28, 5,500 second-feet. Discharge for days for which gage heights are missing after Feb. 1 estimated by comparison with records at Blackfoot station.

Monthly discharge of Snake River at Neeley, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	5,510	4,350	5,010	308,000	A.
November	6,470	5,570	6,050	360,000	A.
December	6,440	....	5,730	352,000	B.
January	10,600	....	5,880	362,000	C.
February	12,800	5,270	6,920	384,000	B.
March	8,910	5,160	7,500	461,000	A.
April	12,200	6,630	8,000	476,000	A.
May	22,900	12,600	18,400	1,130,000	A.
June	37,600	17,800	29,700	1,770,000	A.
July	25,800	3,830	12,700	781,000	A.
August	9,280	3,150	5,810	357,000	A.
September	6,160	5,160	5,640	336,000	A.
The year	37,600	....	9,780	7,080,000	

SNAKE RIVER AT HOWELL'S FERRY, NEAR MINIDOKA, IDAHO.

Location.—In sec. 2, T. 9 S., R. 25 E., Boise meridian, 100 yards below Howell's ferry, about 1 mile below the Reclamation Service dam and about 6 miles south of Minidoka post office, the nearest railroad point. About 6 miles above the Montgomery's ferry station, discontinued December 31, 1910. Raft River enters between the Neeley and Minidoka stations.

Records available.—April 21, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Lietz automatic gage installed August 28, 1911, on the right bank referred to and directly across the river from the staff gage used previous to August 28, 1911.

Channel.—Coarse gravel; shifts slightly but infrequently.

Discharge measurements.—Made from a cable about 50 feet below the gage.

Winter flow.—Relation between gage height and discharge is somewhat affected by ice.

Diversions and storage.—The North Side and South Side Minidoka canals divert between Neeley and the Minidoka station. No diversions between the station and the Twin Falls North Side and South Side canals at Milner. About 54,000 acre-feet storage is possible at Minidoka dam.

Accuracy.—Conditions for measuring discharge good; records reliable for greater part of year.

Cooperation.—Expense of maintenance borne by the United States Reclamation Service.

Discharge measurements of Snake River at Howell's ferry, near Minidoka, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 14	A. B. Purton	6.80	7,170	Aug. 13	O. W. Hartwell	6.43	5,740
May 10	O. W. Hartwell	9.99	18,100	13	do	5.97	4,580
11	do	10.10	18,500	16	do	5.36	3,280
29	A. B. Purton	10.40	20,200	17	do	5.08	2,760
June 9	do	11.73	25,400	23	do	4.73	2,140
July 29	H. L. Stoner	6.02	4,570	24	do	4.87	2,490
Aug. 11	O. W. Hartwell	5.73	4,000				

Daily gage height, in feet, of Snake River at Howell's ferry, near Minidoka, Idaho, for the year ending Sept. 30, 1911.

[Foxley and Anderson, observers.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	5.3	5.1	6.6	......	8.15	6.30	......	8.20	9.45	11.20	5.82	5.22
2	5.35	5.0	6.5	6.05	8.40	6.28	6.78	8.30	9.45	11.22	5.62	5.47
3	5.35	5.9	6.6	6.05	8.52	6.20	6.70	8.20	9.80	11.22	5.79	5.75
4	5.35	7.1	6.6	5.90	7.38	6.30	6.75	8.20	10.60	11.15	5.99	5.53
5	5.3	6.85	6.6	5.90	8.15	6.58	7.02	8.25	11.18	10.92	6.12	5.36
6	5.3	6.45	6.6	5.85	7.88	6.90	7.10	8.35	11.30	9.95	6.43	5.36
7	5.3	6.3	6.6	5.82	7.52	7.20	7.25	8.75	11.35	9.40	6.06	5.34
8	5.3	6.3	6.6	5.85	7.15	7.35	7.25	9.20	11.55	9.52	5.44	5.34
9	5.3	6.4	6.6	6.15	7.08	7.42	6.90	9.80	11.72	9.35	5.49	5.36
10	5.4	6.4	6.55	6.45	6.95	7.42	6.85	10.00	11.85	9.05	5.72	5.36
11	5.4	6.4	4.4	6.60	6.82	7.50	6.75	10.15	12.00	8.90	5.86	5.38
12	5.4	6.4	4.4	6.65	6.80	7.48	6.75	10.05	12.10	7.68	6.45	5.42
13	5.4	6.4	4.4	6.45	6.70	7.35	6.85	9.85	11.85	7.53	6.19	5.75
14	5.5	6.4	4.4	6.50	6.65	7.25	6.80	9.70	11.88	7.50	5.94	6.07
15	5.5	6.4	4.3	6.40	6.70	7.20	6.72	9.55	12.10	7.60	5.82	5.41
16	5.3	6.4	4.3	5.98	6.72	7.08	6.60	9.75	12.25	7.25	5.56	5.55
17	5.4	6.4	4.25	6.55	6.62	7.08	6.60	10.05	12.55	7.05	5.11	5.75
18	5.45	6.0	5.35	6.45	6.50	7.10	6.55	10.40	12.95	6.71	5.03	5.80
19	5.7	5.3	6.2	6.25	6.38	7.12	6.70	10.80	13.15	6.56	5.01	5.66
20	5.75	4.6	6.25	6.58	6.35	6.98	6.50	10.80	13.25	6.45	5.03	5.64
21	5.8	5.35	6.2	6.55	6.32	6.98	6.70	10.55	13.38	6.30	4.97	6.06
22	5.8	6.9	6.2	6.22	6.32	6.95	6.90	10.15	13.42	5.89	4.95	6.06
23	5.8	7.7	6.2	6.28	6.30	7.00	6.88	10.00	13.42	5.79	4.78	5.97
24	5.8	7.0	6.1	6.30	6.30	6.95	6.85	9.65	13.60	6.17	5.18	5.86
25	5.85	7.1	6.2	7.52	6.35	7.02	6.88	9.50	13.68	5.99	4.83	5.90
26	5.85	6.85	6.3	8.38	6.32	7.15	6.80	9.55	13.45	6.20	5.11	5.77
27	5.85	6.9	6.4	8.30	6.22	7.00	6.80	9.75	13.25	6.40	5.08	5.81
28	5.8	6.95	6.4	7.70	6.38	7.10	7.05	10.15	11.92	6.20	5.13	5.76
29	5.8	6.85	6.3	7.40	......	7.00	7.35	10.32	11.10	6.04	5.28	5.81
30	5.8	6.6	6.2	7.40	......	7.05	7.90	10.30	10.95	6.02	5.46	5.68
31	5.8	......	......	7.78	......	6.92	......	9.75	......	6.51	5.28	......

NOTE.—Recorded gage heights Dec. 11 to 18 probably unreliable.

Daily discharge, in second-feet, of Snake River at Howell's ferry, near Minidoka, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	3,540	3,140	6,580	5,280	11,600	5,780	7,290	11,600	16,000	23,300	4,230	3,030
2	3,640	2,940	6,300	5,160	12,500	5,730	7,080	11,900	16,000	23,400	3,790	3,490
3	3,640	4,800	6,580	5,160	13,000	5,520	6,860	11,500	17,500	23,400	4,170	4,080
4	3,640	8,040	6,580	4,800	8,920	5,780	7,000	11,400	20,800	23,100	4,610	3,610
5	3,540	7,290	6,580	4,800	11,600	6,520	7,800	11,600	23,300	22,200	4,900	3,280
6	3,540	6,170	6,580	4,690	10,600	7,440	8,040	11,900	23,800	18,100	5,670	3,280
7	3,540	5,780	6,580	4,620	9,360	8,340	8,500	13,400	24,000	15,800	4,760	3,240
8	3,540	5,780	6,580	4,690	8,190	8,820	8,500	15,100	24,800	16,300	3,430	3,240
9	3,540	6,040	6,580	5,400	7,980	9,040	7,440	17,500	25,500	15,600	3,530	3,280
10	3,740	6,040	6,440	6,170	7,590	9,040	7,290	18,300	26,100	14,400	4,010	3,280
11	3,740	6,040	2,000	6,580	7,200	9,300	7,000	18,900	26,700	13,800	4,320	3,310
12	3,740	6,040	2,000	6,720	7,140	9,240	7,000	18,500	27,100	9,330	5,720	3,390
13	3,740	6,040	2,000	6,170	6,860	8,820	7,290	17,700	26,100	8,850	5,070	4,080
14	3,940	6,040	2,000	6,300	6,720	8,500	7,140	17,000	26,200	8,750	4,500	4,780
15	3,940	6,040	1,880	6,040	6,860	8,340	6,920	16,400	27,100	9,070	4,230	3,370
16	3,540	6,040	1,880	4,990	6,920	7,980	6,580	17,200	27,800	7,960	3,670	3,650
17	3,740	6,040	1,820	6,440	6,640	7,980	6,580	18,500	29,000	7,360	2,830	4,080
18	3,840	5,040	3,640	6,170	6,300	8,040	6,440	20,000	30,700	6,400	2,680	4,190
19	4,360	3,540	5,520	5,650	5,990	8,100	6,860	21,700	31,500	6,010	2,650	3,880
20	4,470	2,270	5,650	6,520	5,910	7,680	6,300	21,700	32,000	5,720	2,680	3,840
21	4,580	3,640	5,520	6,440	5,830	7,680	6,860	20,600	32,500	5,330	2,580	4,760
22	4,580	7,440	5,520	5,570	5,830	7,590	7,440	18,900	32,700	4,390	2,550	4,760
23	4,580	9,960	5,520	5,730	5,780	7,740	7,380	18,300	32,700	4,170	2,290	4,560
24	4,580	7,740	5,280	5,780	5,780	7,590	7,290	16,800	33,400	5,020	2,950	4,320
25	4,690	8,040	5,520	9,360	5,910	7,800	7,380	16,200	33,800	4,610	2,360	4,410
26	4,690	7,290	5,780	12,500	5,830	8,190	7,140	16,400	32,800	5,090	2,830	4,120
27	4,690	7,440	6,040	12,200	5,570	7,740	7,140	17,200	32,000	5,590	2,770	4,210
28	4,580	7,590	6,040	9,960	5,990	8,040	7,850	18,900	26,400	5,090	2,860	4,100
29	4,580	7,290	5,780	8,980	......	7,740	8,740	19,600	22,900	4,720	3,130	4,210
30	4,580	6,580	5,520	8,980	......	7,890	10,500	19,600	22,300	4,670	3,470	3,930
31	4,580	......	5,500	10,200	......	7,500	......	17,200	......	5,880	3,130	......

NOTE.—Discharge determined from well-defined rating curves applicable Oct. 1, 1910, to Apr. 27, 1911, and May 10 to Sept. 30, 1911. Indirect method for shifting channels used Apr. 28 to May 9. Discharge Dec. 11 to 18 of doubtful accuracy because of unreliable gage heights.

Monthly discharge of Snake River at Howell's ferry, near Minidoka, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	4,690	3,540	4,050	249,000	A.
November	9,960	2,270	6,070	361,000	A.
December	6,580	1,820	5,030	309,000	C.
January	12,500	4,620	6,710	413,000	A.
February	13,000	5,570	7,660	425,000	A.
March	9,300	5,520	7,790	479,000	A.
April	10,500	6,300	7,390	440,000	A.
May	21,700	11,400	16,800	1,030,000	A.
June	33,800	16,000	26,800	1,590,000	A.
July	23,400	4,170	10,800	664,000	A.
August	5,720	2,290	3,620	223,000	A.
September	4,780	3,030	3,860	230,000	A.
The year	33,800	1,820	8,880	6,410,000	

NORTH SIDE MINIDOKA CANAL NEAR MINIDOKA, IDAHO.

Location.—In sec. 1, T. 9 S., R. 25 E. Boise meridian, about 350 feet below the Minidoka dam and 6 miles south of Minidoka.

Records available.—May 1, 1909, to November 18, 1911, except during winter months.

Gage.—A Friez aautomatic gage set each week by an outside sliding gage. A siphon gage with datum 0.08 foot higher was used to set the automatic gage during 1910, but original gage datum was used during 1911.

Channel.—Rock cut; permanent but rough.

Discharge measurements.—Made from suspension footbridge a few feet above the gage.

Diversions.—No diversions made from canal close enough to the station to affect gage heights.

Accuracy.—Conditions for determining discharge fairly good; records reliable.

Cooperation.—Expense of maintenance borne by the United States Reclamation Service.

Discharge measurements of North Side Minidoka canal near Minidoka, Idaho, in the period Apr. 1 to Dec. 10, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 7	Hartwell and Purton	3.54	274	May 29	A. B. Purton	7.67	1,050
25	.....do	4.79	476	June 10	.....do	8.26	1,180
28	A. B. Purton	5.62	613	Aug. 27	O. W. Hartwell	7.76	1,070
May 11	O. W. Hartwell	7.81	1,080	Dec. 10	H. L. Stoner	1.50	61

Daily gage height, in feet, of North Side Minidoka canal near Minidoka, Idaho, for the period Apr. 1 to Nov. 18, 1911.

[F. J. Anderson, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	3.47	....	8.06	8.02	7.93	7.58	6.46	3.62
2	3.47	5.80	8.25	7.79	8.03	7.47	6.25	2.31
3	3.48	5.81	8.31	7.71	7.62	7.29	6.27	2.14
4	3.49	6.22	8.30	7.71	7.29	7.26	6.13	1.98
5	3.51	6.73	8.01	7.70	7.38	7.20	6.03	1.94
6	3.55	6.95	8.27	7.68	7.38	6.88	6.04	1.82
7	3.56	7.00	8.26	7.72	7.38	6.75	5.85	1.71
8	3.56	7.08	8.27	7.75	8.06	6.79	5.73	1.78
9	3.56	7.15	8.25	7.82	8.25	6.68	5.70	1.98
10	3.55	7.66	8.27	7.87	8.24	6.49	5.68	2.05
11	3.55	7.80	8.30	7.92	8.20	6.90	5.67	2.05
12	3.55	8.18	8.30	7.98	8.23	7.00	5.65	1.64
13	3.55	8.39	8.29	8.03	8.21	6.91	5.61	1.55
14	4.49	8.40	8.30	8.00	8.22	5.40	5.47	1.55
15	4.49	8.41	8.32	8.15	8.16	5.12	5.37	1.55
16	4.49	8.42	8.37	8.34	8.01	4.85	5.29	1.54
17	4.49	8.40	8.39	8.38	8.01	4.86	5.16	1.54
18	4.28	8.28	8.38	8.39	7.56	4.87	5.32	1.54
19	2.89	8.02	8.39	8.41	7.22	5.49	5.55	....
20	2.68	7.90	8.39	8.41	6.94	5.73	5.54	....
21	2.66	7.89	8.33	8.40	6.86	5.73	5.53	....
22	3.90	7.85	8.28	8.40	6.83	5.72	5.53	....
23	4.66	5.08	8.27	8.41	6.98	5.70	5.52	....
24	4.67	1.66	8.30	8.41	7.02	5.70	5.52	....
25	4.74	3.64	8.31	8.39	6.95	6.26	5.52	....
26	5.35	7.00	8.29	8.38	7.50	6.42	5.53	....
27	5.58	7.28	8.23	8.34	7.75	6.43	5.52	....
28	5.61	7.37	8.19	8.37	7.66	6.42	5.52	....
29	5.63	7.60	8.12	8.38	7.50	6.43	5.52	....
30	....	7.68	8.16	8.27	7.58	6.46	5.52	....
31	....	7.95	....	8.17	7.60	....	5.53	....

NOTE.—Canal was dry Jan. 1 to Mar. 31. No records kept after Nov. 18.

Daily discharge, in second-feet, of North Side Minidoka canal near Minidoka, Idaho, for the period Apr. 1 to Nov. 18, 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	263	651	1,130	1,130	1,110	1,030	795	284
2	263	662	1,180	1,080	1,130	1,010	752	122
3	264	664	1,200	1,060	1,040	969	756	107
4	266	746	1,190	1,060	969	963	728	93
5	268	851	1,130	1,060	989	950	708	90
6	274	898	1,190	1,060	989	883	710	81
7	275	908	1,180	1,060	989	856	672	74
8	275	925	1,190	1,070	1,140	864	649	79
9	275	940	1,180	1,090	1,180	841	643	93
10	274	1,050	1,190	1,100	1,180	801	639	99
11	274	1,080	1,190	1,110	1,170	887	637	99
12	274	1,170	1,190	1,120	1,180	908	634	69
13	274	1,210	1,190	1,130	1,170	889	626	64
14	421	1,220	1,190	1,120	1,170	586	599	64
15	421	1,220	1,200	1,160	1,160	534	580	64
16	421	1,220	1,210	1,200	1,130	485	565	63
17	421	1,220	1,210	1,210	1,130	487	541	63
18	386	1,190	1,210	1,210	1,030	489	571	63
19	187	1,130	1,210	1,220	954	603	614	....
20	162	1,100	1,210	1,220	895	649	613	....
21	160	1,100	1,200	1,220	879	649	611	....
22	326	1,090	1,190	1,220	872	647	611	....
23	451	526	1,190	1,220	904	643	609	....
24	453	71	1,190	1,220	912	643	609	....
25	465	287	1,200	1,210	897	754	609	....
26	576	908	1,190	1,210	1,020	786	611	....
27	620	967	1,180	1,200	1,070	788	609	....
28	626	986	1,170	1,210	1,050	786	609	....
29	630	1,040	1,150	1,210	1,020	788	609	....
30	640	1,050	1,160	1,190	1,030	795	609	....
31	....	1,110	....	1,160	1,040	....	611	....

NOTE.—Discharge determined from a well-defined rating curve. Discharge interpolated for Apr. 30 to May 1.

Monthly discharge of North Side Minidoka canal near Minidoka, Idaho, for the period Apr. 1 to Nov. 18, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April	640	160	363	21,600	B.
May	1,220	71	941	57,900	A.
June	1,210	1,130	1,190	70,800	A.
July	1,220	1,060	1,150	70,700	A.
August	1,180	872	1,050	64,600	A.
September	1,030	485	765	45,500	A.
October	795	541	637	39,200	A.
November 1-18	284	63	92.8	3,310	A.
The period				374,000	

SOUTH SIDE MINIDOKA CANAL NEAR MINIDOKA, IDAHO.

Location.—In sec. 12, T. 9 S., R. 25 E., Boise meridian, about 300 yards below the Minidoka dam and about 6 miles south of Minidoka.

Records available.—April 21, 1909, to December 31, 1911.

Gage.—Friez automatic. Position of gage was changed between the seasons of 1909 and 1910, the gage being moved 200 or 300 feet farther down the canal. Datum unchanged since the spring of 1910.

Channel.—Canal section is in earth and may shift. The canal was widened below the station during the winter of 1910-11, changing the relation of gage height to discharge.

Discharge measurements.—Made from a suspension footbridge a few feet above the gage.

Accuracy.—Grade of the canal is light and velocities are low, but records are believed to be reliable. Conditions have, however, necessitated the use of several rating curves.

Cooperation.—Expense of maintenance borne by the Reclamation Service.

Discharge measurements of South Side Minidoka canal near Minidoka, Idaho, in the period Apr. 1 to Nov. 10, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 7	Hartwell and Purton	2.12	167	Aug. 5	T. W. Parry et al.	4.74	669
28	A. B. Purton	2.51	228	12	do	4.40	595
28	do	2.51	229	13	O. W. Hartwell	4.60	596
May 11	O. W. Hartwell	3.23	361	17	T. W. Parry et al.	4.54	584
29	A. B. Purton	2.83	295	22	O. W. Hartwell	4.60	545
June 9	do	3.78	476	27	do	4.24	467
July 11	T. W. Parry et al.	4.70	647	Sept. 5	do	4.07	440
21	do	5.01	778	6	do	3.72	374
22	do	4.98	731	9	T. W. Parry et al.	4.04	450
28	do	4.73	716				

Daily gage height, in feet, of South Side Minidoka canal near Minidoka, Idaho, for the period Apr. 1 to Nov. 10, 1911.

[F. J. Anderson, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	1.98	2.50	3.10	4.62	4.62	4.23	3.61	0.91
2	2.09	2.51	3.15	4.58	4.69	4.20	3.55	.95
3	2.15	2.55	3.34	4.54	4.67	4.13	3.44	1.12
4	2.15	2.69	3.57	4.54	4.71	4.09	3.38	1.14
5	2.18	2.73	3.70	4.53	4.74	4.08	3 40	1.10
6	2.19	2.73	3.80	4.53	4.74	4.01	3.40	1.01
7	2.15	2.79	3.79	4.56	4.64	4.01	3.38	.96
8	2.15	2.92	3.80	4.57	4.64	4.01	3.37	.96
9	2.14	3.11	3.80	4.54	4.65	4.04	3.37	.96
10	2.15	3.24	3.81	4.52	4.56	4.07	3.32	.95
11	2.16	3.15	3.81	4.59	4.35	3.99	3.11	
12	2.19	2.35	3.84	4.64	4.38	3.91	3.07	
13	2.15	3.46	3.92	4.76	4.49	3.92	3.09	
14	2.14	3.16	4.00	4.73	3.25	3.90	2.75	
15	2.13	3.18	4.13	4.78	4.50	3.92	2.05	
16	2.15	3.18	4.31	4.87	4.55	3.99	2.11	
17	2.15	3.06	4.36	4.86	4.54	3.98	2.42	
18	2.19	2.86	4.38	4.91	4.66	3.96	2.56	
19	2.20	2.88	4.39	4.97	4.59	3.93	2.64	
20	2.13	2.82	4.40	4.99	4.58	3.92	2.67	
21	2.14	2.83	4.43	5.00	4.55	3.89	2.66	
22	2.19	2.82	4.46	4.97	4.58	3.89	2.65	
23	2.28	2.81	4.47	2.51	4.44	3.87	2.64	
24	2.28	2.81	4.48	3.77	4.24	3.82	2.64	
25	2.28	2.81	4.51	4.84	4.18	3.69	2.63	
26	2.36	2.82	4.55	4.78	4.21	3.68	2.60	
27	2.46	2.80	4.57	4.75	4.25	3.62	2.61	
28	2.50	2.82	4.56	4.78	4.26	3.61	2.60	
29	2.52	2.82	4.48	4.78	4.21	3.60	2.60	
30	2.51	2.81	4.52	4.29	4.24	3.59	2.10	
31		2.94		4.68	4.26		0.97	

NOTE.—Canal was practically dry Jan. 1 to Mar. 31 and Nov. 11 to Dec. 31.

Daily discharge, in second-feet, of South Side Minidoka canal near Minidoka, Idaho, for the period Apr. 1 to Nov. 10, 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	147	228	338	650	650	472	351	31
2	163	230	348	642	666	466	340	33
3	172	237	386	633	661	452	319	43
4	172	261	432	633	670	444	307	44
5	176	268	458	631	677	442	311	42
6	178	268	478	631	677	428	311	37
7	172	279	476	638	655	428	307	34
8	172	303	478	640	655	428	306	34
9	170	340	478	633	657	434	306	34
10	172	366	480	629	638	440	297	33
11	173	348	480	644	594	424	261	
12	178	203	486	655	600	408	254	
13	172	410	503	681	572	410	257	
14	170	350	520	675	323	406	207	
15	169	354	547	686	574	410	121	
16	172	354	585	705	585	424	128	
17	172	330	596	703	583	422	164	
18	178	292	600	714	605	418	182	
19	179	295	602	727	575	412	192	
20	169	285	604	732	560	410	196	
21	170	286	610	734	545	404	195	
22	178	285	617	727	546	404	194	
23	192	283	619	230	516	400	192	
24	192	283	621	472	474	391	192	
25	192	283	627	699	462	366	191	
26	205	285	635	686	468	364	187	
27	221	281	640	679	476	353	188	
28	228	285	638	686	479	351	187	
29	231	285	621	686	468	349	187	
30	230	283	629	582	474	347	127	
31		307		664	479		34	

NOTE.—Discharges determined from well-defined rating curves. Indirect methods were used Aug. 18 to 21. Some water was used for puddling Mar. 27 to 31.

Monthly discharge of South Side Minidoka canal near Minidoka, Idaho, for the period Apr. 1 to Nov. 10, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April	231	147	182	10,800	A.
May	410	208	295	18,100	A.
June	640	338	538	32,000	A.
July	734	230	649	39,900	A.
August	677	323	567	34,900	A.
September	472	347	410	24,400	A.
October	351	34	226	13,900	B.
November 1-10	44	31	36.5	724	C.
The period	....	....	....	175,000	

LAKE MILNER AT MILNER, IDAHO.

Location.—In sec. 29, T. 10 S., R. 21 E., Boise meridian, in the backwater of the Twin Falls Co.'s dam, in Snake River at Milner, Idaho.

Records available.—April 10 to September 30, 1911.

Gage.—Vertical staff fastened to concrete side wall at the right end of the gates on the dam.

Accuracy.—Gage heights affected by wind on the lake.

Cooperation.—Gage heights furnished by the Twin Falls Canal Co.

Daily gage height, in feet, of Lake Milner at Milner, Idaho, for the year ending Sept. 30, 1911.

[F. W. Deming, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Day.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	10.05	10.0	10.1	8.96	8.00	16	9.7	10.0	10.05	9.95	9.27	9.65
2	......	10.0	10.0	10.05	8.50	7.99	17	9.7	10.0	10.1	10.05	8.85	9.88
3	......	10.0	10.0	10.07	8.45	8.16	18	9.9	9.9	10.15	10.0	8.19	9.96
4	......	9.9	10.1	10.0	8.22	8.75	19	10.0	10.0	10.1	10.0	7.70	9.82
5	......	9.7	10.0	10.0	8.30	8.74	20	9.8	8.2	10.1	10.0	7.55	9.62
6	......	9.98	10.0	9.95	8.70	8.72	21	9.95	9.9	10.1	9.9	7.93	9.90
7	......	9.9	9.95	10.17	9.25	8.81	22	10.05	9.95	10.1	9.1	7.92	10.04
8	......	10.0	10.08	10.15	9.40	8.86	23	9.95	9.9	9.8	8.81	8.15	10.0
9	......	9.97	10.0	10.0	9.09	8.80	24	10.0	9.9	10.15	8.35	8.24	9.92
10	9.6	9.95	10.05	10.03	8.21	8.75	25	10.0	9.95	10.1	8.5	7.98	10.02
11	9.9	10.0	10.1	10.03	8.20	8.8	26	10.0	10.03	10.08	8.18	8.12	9.94
12	9.5	9.8	10.1	10.0	8.42	8.75	27	10.0	10.0	10.0	8.65	8.04	9.9
13	10.0	9.95	10.0	9.8	9.34	8.76	28	10.08	10.0	9.9	9.0	7.84	9.95
14	9.7	9.93	10.0	8.58	9.54	9.22	29	10.1	10.0	10.0	8.9	7.68	10.05
15	9.7	9.98	10.15	10.17	9.42	9.62	30	9.9	9.93	10.05	8.77	7.72	9.91
							31	......	10.0	......	8.71	8.02	......

NOTE.—Gage heights Apr. 10 to July 31 are daily readings; those for Aug. 1 to Sept. 30 are the means of two readings per day.

SNAKE RIVER AT MILNER, IDAHO.

Location.—In sec. 29, T. 10 S., R. 21 E., about 300 yards below the Milner dam. The river receives no tributaries between this station and the one above.

Records available.—May 10, 1909, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Inclined staff on the left bank read at low and medium stages; vertical section read at high stages. This gage was installed October 20, 1909, and set to read the same on that date as the gage previously used, which was located about 100 yards upstream. During parts of the irrigating season, owing to the small flow of water, a temporary station is maintained about 100 yards below the main gage.

Channel.—In lava rock canyon; fairly permanent.

Discharge measurements.—Made from a cable at the gage and from foot planks at the temporary low-water station.

Winter flow.—Not materially affected by ice.

Diversions.—The Twin Falls canals divert water at the Milner dam just above the station and at times during the irrigating season practically the whole flow of the river is taken.

Accuracy.—Conditions for determining discharge are poor, but the records are believed to be fairly reliable.

Cooperation.—Maintained in cooperation with the Twin Falls North Side Land & Water Co. and the Twin Falls Canal Co.

Discharge measurements of Snake River at Milner, Idaho, in the year ending Sept. 30, 1911,

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 19	Lynn Crandall	12.62	4,370	July 28	H. L. Stoner	a 3.02	63
May 27	J. C. Dort	15.10	13,800	Aug. 14	Martin and Hartwell	a 3.02	67
June 13	H. L. Stoner	17.0	19,800	19	H. L. Stoner	a 2.55	41
20	J. C. Dort	18.10	32,000	Sept. 3	O. W. Hartwell	a 2.62	49
July 10	H. L. Stoner	13.8	8,500				

a Gage heights refer to the auxiliary low-water gage.

Daily gage height, in feet, of Snake River at Milner, Idaho, for the year ending Sept. 30. 1911.

[Seckner and Deming, observers.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	10.1	11.9	13.1	12.6	14.35	12.3	12.45	13.6	14.7	16.0	2.95	2.55
2	10.1	11.5	13.0	12.4	14.2	12.45	12.0	13.6	14.7	16.1	2.72	2.55
3	10.0	11.3	12.65	12.5	15.0	12.2	12.5	13.65	15.0	16.2	2.70	2.66
4	10.65	12.1	12.7	12.5	14.7	13.1	12.1	13.65	15.4	16.1	2.58	2.86
5	12.3	13.0	5.85	12.3	14.6	12.85	12.35	13.2	16.0	16.0	2.72	2.77
6	11.9	13.3	14.25	12.2	14.2	12.9	12.7	14.3	16.1	15.3	2.82	2.84
7	11.6	12.85	13.4	11.8	13.85	13.0	13.8	14.3	16.2	14.3	2.95	2.86
8	11.4	12.6	13.15	11.8	13.25	13.3	13.7	14.8	16.5	14.4	3.02	2.80
9	11.0	12.5	12.9	11.9	13.1	13.6	13.5	14.75	16.7	14.2	2.75	2.81
10	11.0	12.5	12.85	12.1	13.1	13.7	12.8	15.3	16.85	13.9	2.54	2.78
11	11.3	12.45	12.8	12.8	12.9	13.53	12.85	15.1	17.0	14.1	2.49	2.79
12	11.5	12.45	12.7	12.7	12.85	13.6	12.45	15.1	17.0	13.35	2.54	2.73
13	11.85	12.6	12.8	12.55	12.75	13.7	13.1	14.8	16.8	12.6	2.96	2.75
14	11.7	4.55	12.85	12.5	12.5	13.52	13.0	14.8	16.7	......	3.10	2.88
15	11.9	12.35	12.85	12.1	12.65	13.4	12.65	14.6	16.9	12.4	3.08	2.99
16	10.2	13.45	12.3	12.2	12.77	12.8	12.5	14.9	17.1	10.0	2.95	3.06
17	10.6	13.45	12.45	12.0	12.75	13.0	11.85	15.5	17.3	10.2	2.84	......
18	10.5	12.85	12.45	11.7	12.7	13.03	11.5	14.75	17.7	10.2	2.67	9.46
19	11.2	12.15	12.2	11.7	12.6	13.2	11.4	15.7	17.9	10.3	2.48	9.61
20	12.4	13.0	12.3	12.55	12.5	13.12	11.8	15.5	18.15	10.0	2.38	......
21	12.2	11.5	12.2	12.45	12.25	13.0	12.1	15.9	18.3	4.4	2.44	......
22	12.1	12.3	12.6	12.28	12.2	12.97	12.38	15.5	18.6	4.1	2.44	9.43
23	12.1	12.9	12.7	12.0	12.2	12.9	12.5	15.2	18.1	3.8	2.78	9.38
24	11.95	13.6	12.6	12.0	12.2	12.9	12.52	14.9	18.5	3.5	2.61	9.11
25	12.0	13.15	12.6	13.0	12.2	13.0	11.8	14.8	18.6	3.8	2.50	......
26	11.9	13.35	12.65	14.4	12.23	12.9	11.8	14.7	18.6	2.9	2.61	......
27	12.1	13.35	12.75	14.6	12.17	13.0	11.7	15.1	18.1	2.9	2.54	......
28	12.1	13.3	12.5	14.0	12.0	13.0	12.05	15.5	17.5	3.1	2.48	......
29	12.0	13.3	12.5	13.7	......	12.75	12.4	15.7	16.0	3.0	2.52	9.50
30	12.05	13.2	12.6	13.25	......	12.58	13.4	15.7	15.8	2.9	2.48	......
31	11.9	......	12.6	13.6	......	12.5	......	14.8	......	2.89	2.61	......

NOTE.—Gage heights July 21 to Sept. 16 read on the temporary low-water gage. The low readings of Nov. 14 and Dec. 5 were caused by closing the spillway gates at the dam.

Daily discharge, in second-feet, of Snake River at Milner, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1,370	3,080	5,770	4,470	10,600	3,810	4,130	7,420	12,400	19,400	61	45
2	1,370	2,500	5,480	4,020	9,950	4,130	3,240	7,420	12,400	20,000	52	45
3	1,320	2,260	4,590	4,240	13,900	3,610	4,240	7,610	13,900	20,600	51	49
4	1,660	3,420	4,710	4,420	12,400	5,770	3,420	7,610	16,100	20,000	46	57
5	3,810	5,480	200	3,810	11,800	5,080	3,920	6,070	19,400	19,400	52	54
6	3,080	6,380	10,200	3,610	9,950	5,210	4,710	10,400	20,000	15,500	56	57
7	2,630	5,080	6,710	2,920	8,410	5,480	8,200	10,400	20,600	10,400	61	57
8	2,380	4,470	5,920	2,920	6,220	6,380	7,800	12,900	22,300	10,900	64	55
9	1,940	4,240	5,210	3,080	5,770	7,420	7,060	12,600	23,500	9,950	53	55
10	1,940	4,240	5,080	3,420	5,770	7,800	4,950	15,500	24,400	8,620	45	54
11	2,260	4,130	4,950	4,950	5,210	7,170	5,080	14,400	25,300	9,500	43	55
12	2,500	4,130	4,710	4,710	5,080	7,420	4,130	14,400	25,300	6,540	45	52
13	3,000	4,470	4,950	4,360	4,830	7,800	5,770	12,900	24,100	4,470	61	53
14	2,770	150	5,080	4,240	4,240	7,130	5,480	12,900	23,500	4,240	67	58
15	3,080	3,920	5,080	3,420	4,590	6,710	4,590	11,800	24,700	4,020	66	63
16	1,420	6,880	3,810	3,610	4,880	4,950	4,240	13,400	25,900	1,320	61	65
17	1,630	6,880	4,130	3,240	4,830	5,480	3,000	16,600	27,100	1,420	57	415
18	1,570	5,080	4,130	2,770	4,710	5,570	2,500	12,600	29,500	1,420	50	1,080
19	2,150	3,520	3,810	2,770	4,470	6,070	2,380	17,800	30,800	1,470	42	1,140
20	4,020	5,480	3,610	4,360	4,240	5,830	2,920	16,600	32,300	1,320	39	1,120
21	3,610	2,500	3,610	4,130	3,710	5,480	3,420	18,900	33,300	125	41	1,090
22	3,420	3,810	4,470	3,770	3,610	5,400	3,980	16,600	35,100	110	41	1,070
23	3,420	5,210	4,710	3,240	3,610	5,210	4,240	15,000	32,000	95	54	1,050
24	3,160	7,420	4,470	3,240	3,610	5,210	4,290	13,400	34,500	83	47	953
25	3,240	5,920	4,470	5,480	3,610	5,480	2,920	12,900	35,100	95	43	982
26	3,080	6,540	4,590	10,900	3,670	5,210	2,920	12,400	35,100	59	47	1,010
27	3,420	6,540	4,830	11,800	3,550	5,480	2,770	14,400	32,000	59	45	1,040
28	3,420	6,380	4,240	9,060	3,240	5,480	3,330	16,600	28,300	67	42	1,070
29	3,240	6,380	4,240	7,800	....	4,830	4,020	17,800	19,400	63	44	1,100
30	3,330	6,070	4,470	6,220	....	4,420	6,710	17,800	18,300	59	42	788
31	3,080	....	4,470	7,420	....	4,240	....	12,900	....	59	47	....

Note.—Discharge determined from rating curves for the regular and temporary gages which are fairly well defined. Discharge for Sept. 17 estimated from a. m. reading on temporary gage and p. m. reading on regular gage.

Monthly discharge of Snake River at Milner, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	4,020	1,320	2,660	164,000	B.
November	7,420	150	4,750	283,000	B.
December	10,200	200	4,730	291,000	B.
January	11,800	2,770	4,780	294,000	B.
February	13,900	3,240	6,090	338,000	B.
March	7,800	3,610	5,650	347,000	B.
April	8,200	2,380	4,350	259,000	B.
May	18,900	6,070	13,200	812,000	B.
June	35,100	12,400	25.200	1,500,000	B.
July	20,600	59	6,170	379,000	B.
August	67	39	50.5	3,110	B.
September	1,140	45	493	29,300	B.
The year	35,100	39	6,510	4,700,000	

NORTH SIDE TWIN FALLS CANAL AT MILNER, IDAHO.

Location.—In sec. 20, T. 10 S., R. 21 E. Boise meridian, at a highway bridge about three-fourths of a mile below the headgates at the Milner dam.

Records available.—May 10, 1909, to September 30, 1911.

Gage.—Vertical staff; datum unchanged.

Channel.—Permanent, but is badly covered with moss during certain seasons of the year; during winter of 1909–10 canal was lined with concrete.

Discharge measurements.—Made from cable about 150 feet below gage.

Winter flow.—Not affected by ice.

Accuracy.—Individual measurements can be made with a fair degree of accuracy, but the daily discharge estimates are approximate at times on account of the unusually variable relation between gage height and discharge, caused principally by the moss growth, but perhaps in some measure by changes in entrance velocity at the head gates or other unexplained phenomena. Monthly estimates, however, are based on sufficient actual measurements to be fairly reliable.

Cooperation.—Many of the discharge measurements were furnished by the Twin Falls North Side Land & Water Co. and the gage heights by the Twin Falls Canal Co.

Discharge measurements of North Side Twin Falls canal at Milner, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 1	E. A. Porter	3.95	700	July 26	C. A. McClelland	6.20	1,890
Nov. 16	.....do	4.00	756	28	H. L. Stoner	6.75	2,150
20	.....do	2.85	464	28	.....do	6.73	2,140
28	.....do	1.05	130	Aug. 11	C. A. McClelland	6.01	1,520
Dec. 29	.....do	2.60	502	12	.....do	6.20	1,580
				12	.....do	6.30	1,610
1911.				13	.....do	6.98	1,840
Jan. 11	.....do	4.45	1,140	13	.....do	7.20	1,960
Feb. 3	.....do	3.75	961	14	.....do	7.30	2,010
23	C. A. McClelland	4.50	1,200	14	O. W. Hartwell	7.18	2,120
Mar. 6	.....do	3.95	1,020	15	.....do	7.13	2,070
11	.....do	4.25	1,100	15	C. A. McClelland	7.05	1,920
23	.....do	2.68	480	16	.....do	7.00	1,910
31	.....do	6.40	1,900	17	.....do	6.70	1,750
May 5	J. C. Dort	7.35	2,430	18	H. L. Stoner	6.00	1,490
27	.....do	7.65	2,380	18	C. A. McClelland	5.98	1,490
29	C. A. McClelland	7.70	2,400	19	.....do	5.53	1,330
June 4	.....do	7.70	2,400	19	H. L. Stoner	2.81	449
5	.....do	7.80	2,420	19	.....do	2.41	351
13	H. L. Stoner	7.80	2.550	22	C. A. McClelland	2.68	385
19	C. A. McClelland	7.90	2,740	25	.....do	4.00	801
20	.....do	7.90	2,730	26	.....do	4.38	933
July 8	.....do	7.80	2,730	27	.....do	5.98	1,490
10	H. L. Stoner	7.75	2,690	27	A. V. Tallman	6.03	1,340
10	A. V. Tallman	8.0	2,680	28	.....do	6.0	1,320
14	H. L. Stoner	5.25	1,530	28	C. A. McClelland	5.78	1,410
14	Stoner and McClelland	6.30	1,940	29	A. V. Tallman	5.75	1,210
23	C. A. McClelland	6.80	2,180	Sept. 3	O. W. Hartwell	5.91	1,390
24	.....do	6.40	1,940	16	C. A. McClelland	7.27	1,840

Daily gage height, in feet, of North Side Twin Falls canal at Milner, Idaho, for the year ending Sept. 30, 1911.

[Seckner and Deming, observers.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	5.55	3.9	2.0	1.30	3.95	4.50	6.30	7.50	7.65	7.80	6.82	5.86
2	4.1	3.5	2.0	1.20	3.95	4.00	7.70	7.45	7.75	7.78	6.35	5.78
3	4.1	3.3	2.7	1.25	3.85	4.00	6.35	7.45	7.75	7.80	6.29	5.96
4	4.0	3.45	2.75	1.30	3.90	4.00	7.50	7.45	7.75	7.75	6.10	6.52
5	4.1	3.5	1.15	2.10	3.70	3.95	7.60	7.20	7.80	7.75	6.16	6.35
6	4.8	3.5	2.7	3.80	3.70	3.90	7.60	4.22	7.75	7.68	6.48	5.88
7	4.5	3.3	2.9	3.20	4.10	3.95	.80	4.50	7.70	7.85	6.29	6.30
8	4.4	3.5	2.3	3.50	3.85	3.45	.80	4.55	7.80	7.83	6.24	6.31
9	4.5	3.5	2.5	3.70	4.00	3.40	1.20	7.45	7.70	7.75	6.10	6.28
10	4.2	3.8	2.9	4.10	4.20	3.45	4.10	7.45	7.78	7.73	6.10	6.24
11	......	3.8	2.8	4.45	4.10	4.15	4.38	7.60	7.80	7.70	6.06	6.26
12	1.6	3.85	3.0	4.30	4.30	4.05	4.65	7.45	7.80	7.70	6.24	6.26
13	2.65	3.9	2.0	4.35	4.20	4.05	4.75	7.55	7.75	7.50	7.06	5.96
14	2.3	4.0	2.0	4.30	4.20	4.20	5.00	7.55	7.75	5.78	7.24	6.48
15	2.3	3.9	2.4	4.30	4.30	4.30	5.00	7.55	7.85	7.82	7.12	6.90
16	5.1	3.95	2.4	4.20	4.30	5.10	5.10	7.60	7.78	7.65	6.97	7.20
17	3.9	3.85	2.8	3.80	4.35	5.30	6.60	7.65	7.85	7.75	6.56	7.38
18	4.2	3.8	2.8	4.10	4.35	5.25	7.20	7.60	7.87	7.70	5.96	7.42
19	3.65	3.5	......	4.80	4.22	5.40	7.23	7.70	7.85	7.70	3.30	7.34
20	3.7	2.1	......	4.75	4.20	5.35	7.20	6.20	7.85	7.70	2.46	7.09
21	3.6	......	......	4.40	4.05	5.45	7.25	7.50	7.85	7.50	2.60	7.54
22	3.5	......	......	4.38	4.20	5.40	7.50	7.60	7.85	6.80	2.66	7.58
23	3.4	2.0	1.1	4.20	4.45	2.85	7.45	7.55	7.60	6.75	1.92	7.58
24	3.4	1.75	1.1	4.10	4.30	5.10	6.10	7.55	7.90	6.30	2.61	7.52
25	3.4	1.05	1.1	4.00	4.30	5.20	7.55	7.60	7.85	6.25	3.35	7.70
26	3.35	1.05	2.4	4.30	4.35	5.70	7.55	7.65	7.80	6.10	4.79	7.56
27	3.4	1.0	2.4	4.30	4.35	6.10	7.55	7.60	7.75	6.45	5.92	7.52
28	3.4	1.05	2.6	3.90	4.10	6.10	7.50	7.60	7.68	6.70	5.71	7.56
29	3.4	1.05	2.6	4.10	......	6.30	7.55	7.65	7.75	6.60	5.56	7.68
30	3.4	......	1.6	3.25	......	6.30	7.40	7.60	7.78	6.65	5.64	7.58
31	3.4	......	1.3	3.55	......	6.35	......	7.65	......	6.61	5.88	......

NOTE.—Head gates closed on days for which gage heights are missing October to December.

Daily discharge, in second-feet, of North Side Twin Falls canal at Milner, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1,310	718	346	181	980	1,200	1,970	2,510	2,380	2,650	2,300	1,420
2	737	582	346	161	980	1,000	2,600	2,490	2,420	2,640	1,870	1,370
3	737	522	538	171	942	1,000	1,990	2,490	2,420	2,650	1,810	1,430
4	700	566	553	181	961	1,000	2,510	2,490	2,420	2,620	1,710	1,660
5	737	582	151	372	885	980	2,560	2,380	2,440	2,620	1,710	1,570
6	1,000	582	538	923	885	961	2,560	1,080	2,440	2,590	1,830	1,370
7	886	522	600	702	1,040	980	89	1,180	2,430	2,670	1,710	1,520
8	848	582	425	810	942	792	89	1,210	2,490	2,660	1,670	1,520
9	886	582	480	885	1,000	773	161	2,460	2,460	2,620	1,580	1,490
10	774	682	600	1,040	1,080	792	1,040	2,440	2,510	2,620	1,560	1,460
11	0	682	568	1,180	1,040	1,060	1,150	2,500	2,530	2,600	1,530	1,460
12	140	700	633	1,120	1,120	1,020	1,260	2,420	2,550	2,600	1,600	1,450
13	322	718	346	1,140	1,080	1,020	1,300	2,460	2,540	2,510	1,960	1,310
14	253	756	346	1,120	1,080	1,080	1,410	2,460	2,550	1,740	2,030	1,520
15	253	718	452	1,120	1,120	1,120	1,410	2,450	2,610	2,660	1,980	1,680
16	1,120	737	452	1,080	1,120	1,450	1,450	2,460	2,600	2,580	1,920	1,800
17	664	728	568	923	1,140	1,540	2,100	2,470	2,650	2,620	1,740	1,880
18	774	733	568	1,040	1,140	1,520	2,380	2,440	2,670	2,600	1,480	1,890
19	582	650	0	1,330	1,090	1,580	2,390	2,480	2,670	2,600	573	1,860
20	597	270	0	1,300	1,080	1,560	2,380	1,750	2,670	2,600	339	1,750
21	614	0	0	1,160	1,020	1,600	2,400	2,360	2,670	2,510	373	1,950
22	582	0	0	1,150	1,080	1,580	2,510	2,400	2,670	2,200	389	1,960
23	552	346	141	1,080	1,180	584	2,490	2,370	2,560	2,170	224	1,960
24	552	284	141	1,040	1,120	1,450	1,880	2,360	2,690	1,970	376	1,940
25	552	132	141	1,000	1,120	1,490	2,530	2,370	2,670	1,950	588	2,020
26	537	132	452	1,120	1,140	1,710	2,530	2,390	2,650	1,880	1,120	1,960
27	552	122	452	1,120	1,140	1,880	2,530	2,360	2,620	2,040	1,470	1,940
28	552	132	509	961	1,040	1,880	2,510	2,360	2,590	2,150	1,380	1,960
29	552	132	509	1,040	......	1,970	2,530	2,380	2,620	2,080	1,310	2,010
30	552	0	248	720	......	1,970	2,460	2,360	2,640	2,080	1,340	1,960
31	552	......	181	828	......	1,990	......	2,380	......	2,030	1,430	......

NOTE.—Discharge determined from several fairly well defined rating curves and by indirect method for shifting channels.

Monthly discharge of North Side Twin Falls canal at Milner, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	1,310	0	628	38,600	B.
November	756	0	463	27,600	B.
December	633	0	364	22,400	B.
January	1,330	161	903	55,500	A.
February	1,180	885	1,060	58,900	A.
March	1,990	773	1,310	80,600	A.
April	2,600	89	1,910	114,000	A.
May	2,510	1,080	2,280	140,000	B.
June	2,690	2,380	2,560	152,000	B.
July	2,670	1,740	2,400	148,000	A.
August	2,300	224	1,380	84,800	B.
September	2,020	1,310	1,700	101,000	B.
The period	2,690	0	1,410	1,020,000	

SOUTH SIDE TWIN FALLS CANAL AT MILNER, IDAHO.

Location.—In sec. 29, T. 10 S., R. 21 E. Boise meridian, at the wagon bridge about one-eighth mile below the headgates at the Milner dam.

Records available.—May 10, 1909, to September 30, 1911.

Gage.—Vertical staff attached to downstream side of highway bridge.

Channel.—In a rock cut; should remain practically permanent.

Discharge measurements.—Made from the highway bridge.

Winter flow.—Relation between gage height and discharge not affected by ice.

Accuracy.—Conditions for determining discharge good.

Cooperation.—Maintained in Cooperation with the Twin Falls Canal Co.

Discharge measurements of South Side Twin Falls Canal at Milner, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 4	J. C. Dort	6.05	1,290	July 28	H. L. Stoner	9.55	3,180
27	.....do	7.55	2,000	Aug. 15	O. W. Hartwell	8.34	2,400
July 11	H. L. Stoner	9.15	2,900	18	H. L. Stoner	8.22	2,410

Daily gage height, in feet, of South Side Twin Falls canal at Milner, Idaho, for the year ending Sept. 30, 1911.

[Seckner and Deming, observers.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	5.35	3.95	3.9	5.00	3.75	4.10	1.60	5.70	8.10	8.75	9.27	7.30
2	4.65	3.7	3.85	5.30	3.70	3.80	1.60	6.05	8.20	8.75	9.15	7.30
3	4.8	3.9	3.9	4.90	3.20	4.20	3.15	6.08	8.20	8.75	9.04	7.30
4	5.0	3.85	4.1	5.00	3.90	3.20	3.12	6.05	8.30	8.75	8.90	7.30
5	4.75	3.7	4.2	5.00	3.30	3.30	5.10	6.40	8.50	8.75	9.00	7.30
6	4.65	4.9	4.1	4.40	3.38	3.28	3.80	6.50	8.70	8.70	9.12	7.30
7	4.2	5.2	4.2	4.20	3.20	3.30	3.80	6.63	8.70	8.85	9.12	7.30
8	4.25	5.0	3.9	4.00	3.70	3.35	3.80	7.20	8.70	8.85	9.20	7.30
9	3.75	5.0	4.1	4.00	3.90	3.30	3.80	7.05	8.70	8.90	9.18	7.30
10	4.0	5.05	4.1	4.20	4.00	3.35	3.80	7.05	8.75	9.00	8.90	7.30
11	4.0	4.8	4.0	4.30	3.95	4.30	4.00	7.50	8.80	9.00	8.88	7.30
12	4.0	4.0	4.05	3.20	3.48	4.30	4.00	7.50	8.80	9.05	8.64	7.30
13	3.95	4.0	4.0	4.00	3.55	2.60	3.25	8.30	8.80	9.15	8.57	7.31
14	3.95	3.65	4.0	4.20	3.50	3.60	3.40	8.30	8.85	9.00	8.42	7.60
15	4.0	3.5	4.0	4.00	3.50	3.60	3.83	8.22	8.88	9.50	8.38	7.66
16	3.95	4.2	4.1	4.00	3.55	3.60	3.88	7.70	8.95	9.40	8.35	7.05
17	3.95	4.2	4.1	4.40	3.60	3.60	4.32	5.48	9.00	9.50	8.30	6.70
18	3.9	5.05	4.05	4.40	3.55	1.50	5.00	8.00	9.00	9.60	8.30	6.81
19	4.0	5.05	....	4.30	3.50	1.50	4.85	7.60	9.00	9.60	8.26	6.90
20	4.0	4.0	4.4	4.00	3.47	3.50	4.10	7.50	9.00	9.60	8.17	7.03
21	3.75	3.15	4.4	4.38	3.45	3.70	4.18	7.70	9.00	9.50	8.18	7.05
22	3.9	3.6	4.5	4.35	3.50	3.30	4.20	7.70	6.00	9.20	8.16	7.05
23	3.85	4.4	4.5	4.30	3.60	3.45	4.15	7.55	8.90	9.40	8.15	7.02
24	3.9	4.8	4.1	4.00	3.65	4.15	4.30	7.55	9.40	8.90	8.10	7.00
25	3.85	4.65	4.1	3.80	3.65	4.00	4.88	7.55	9.10	9.07	7.74	7.00
26	3.95	4.6	4.1	2.70	3.65	4.20	4.88	7.50	9.10	8.80	7.30	7.02
27	3.95	4.3	3.9	3.60	3.65	3.60	5.30	7.50	8.90	9.30	7.30	7.08
28	3.95	4.1	3.9	3.30	3.40	3.60	5.40	7.50	8.80	9.50	7.30	6.96
29	3.95	3.95	4.1	3.70	....	3.65	5.33	7.40	8.85	9.40	7.28	6.25
30	3.95	3.95	3.6	2.35	....	3.98	5.70	7.75	8.85	9.30	7.30	6.70
31	3.95	....	3.7	3.40	....	3.98	....	7.90	....	9.26	7.30	....

Daily discharge, in second-feet, of South Side Twin Falls canal at Milner, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1,040	585	570	920	525	630	95	1,180	2,300	2,690	3,030	1,880
2	798	510	555	1,020	510	540	95	1,320	2,360	2,690	2,950	1,880
3	850	570	570	885	385	660	372	1,330	2,360	2,600	2,880	1,880
4	920	555	630	920	570	385	365	1,320	2,420	2,690	2,780	1,880
5	832	510	660	920	410	410	955	1,460	2,540	2,690	2,850	1,880
6	798	885	630	720	430	405	540	1,510	2,660	2,660	2,930	1,880
7	660	990	660	660	385	410	540	1,570	2,660	2,750	2,930	1,880
8	675	920	570	600	510	422	540	1,840	2,660	2,750	2,980	1,880
9	525	920	630	600	570	410	540	1,760	2,660	2,780	2,970	1,880
10	600	938	630	660	600	422	540	1,760	2,690	2,850	2,780	1,880
11	600	850	600	690	585	690	600	1,980	2,720	2,850	2,770	1,880
12	600	600	615	385	455	690	600	1,980	2,720	2,880	2,620	1,880
13	585	600	600	600	472	245	398	2,420	2,720	2,950	2,580	1,890
14	585	498	600	660	460	485	435	2,420	2,750	2,850	2,490	2,040
15	600	460	600	600	460	485	549	2,370	2,770	3,180	2,470	2,060
16	585	660	630	600	472	485	564	2,080	2,810	3,110	2,450	1,760
17	585	660	630	720	485	485	696	1,090	2,850	3,180	2,420	1,600
18	570	938	615	720	472	85	920	2,250	2,850	3,240	2,420	1,650
19	600	938	668	690	460	85	868	2,040	2,850	3,240	2,400	1,690
20	600	600	720	600	452	460	630	1,980	2,850	3,240	2,340	1,750
21	525	372	720	714	448	510	654	2,080	2,850	3,180	2,350	1,760
22	570	485	750	705	460	410	660	2,080	1,300	2,980	2,340	1,760
23	555	720	750	690	485	448	645	2,010	2,780	3,110	2,330	1,740
24	570	850	630	600	498	645	690	2,010	3,110	2,780	2,300	1,740
25	555	798	630	540	498	600	878	2,010	2,920	2,900	2,110	1,740
26	585	780	630	265	498	660	878	1,980	2,920	2,720	1,880	1,740
27	585	690	570	485	498	485	1,020	1,980	2,780	3,040	1,880	1,780
28	585	630	570	410	435	485	1,060	1,980	2,720	3,180	1,880	1,720
29	585	585	630	510	....	498	1,040	1,940	2,750	3,110	1,880	1,400
30	585	585	485	195	....	594	1,180	2,110	2,750	3,040	1,880	1,600
31	585	....	510	435	....	594	....	2,200	....	3,020	1,880	....

NOTE.—Discharge determined from a well-defined rating curve.

Monthly discharge of South Side Twin Falls canal at Milner, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	1,040	525	642	39,500	A
November	990	372	689	41,000	A.
December	750	485	621	38,200	A.
January	1,020	195	636	39,100	A.
February	600	385	482	26,800	A.
March	690	85	478	29,400	A.
April	1,180	95	652	38,800	A.
May	2,420	1,090	1,870	115,000	A.
June	3,110	1,300	2,670	159,000	A.
July	3,240	2,660	2,940	181,000	A.
August	3,030	1,880	2,480	152,000	A.
September	2,060	1,400	1,800	107,000	A.
The year	3,240	85	1,330	967,000	

SNAKE RIVER AT KING HILL, IDAHO.

Location.—In sec. 7, T. 5 S., R. 11 E. Boise meridian, just east of the Oregon Short Line Railroad depot at King Hill, about 30 miles below the entrance of Salmon Falls creek (from the south) and about 20 miles below Big Wood River (from the north).

Records available.—May 13, 1909, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Sloping gage on the right bank installed August 17, 1910, at datum 2.2 feet lower than the old gage on the left bank, which was washed out March 1, 1910. A temporary gage about three-fourths mile upstream was used from March 7, 1910, until the new gage was installed; datum unchanged since August 17, 1910.

Channel.—Lava bowlders and gravel; practically permanent.

Discharge measurements.—Made from a cable a short distance below the gage.

Winter flow.—Relation between gage height and discharge not affected by ice.

Diversions.—No important diversions for irrigation made between the Milner station and King Hill.

Accuracy.—Station well rated; records reliable.

Discharge measurements of Snake River at King Hill, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
1910.				1911.			
Oct. 12	Lynn Crandall	5.99	7,890	May 20	J. C. Dort	12.40	29,800
Nov. 10	.....do	6.82	10,100	29	.....do	10.67	22,600
				June 12	.....do	12.24	30,000
1911.				30	H. L. Stoner	11.30	24,900
Feb. 15	G. C. Baldwin	6.76	9,890	July 8	.....do	8.50	15,000
Mar. 12	Lynn Crandall	8.11	14,500	Aug. 19	Lynn Crandall	5.06	5,610
May 15	A. B. Purton	9.77	19,500	Sept. 23	G. C. Baldwin	5.44	6,720

Daily gage height, in feet, of Snake River at King Hill, Idaho, for the year ending Sept. 30, 1911.

[Gifford, Robb, and McCarthy, observers.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	6.41	7.42	6.65	9.50	6.60	7.10	7.82	9.84	11.11	4.97	5.05
2	5.50	6.39	7.20	6.58	9.25	6.65	7.02	8.03	9.59	11.23	5.00	5.05
3	5.34	6.18	7.10	6.61	8.60	6.67	6.32	8.01	9.64	11.15	5.06	5.05
4	5.70	6.05	7.10	6.69	9.18	6.87	7.09	8.07	10.40	11.07	5.06	5.08
5	5.72	6.50	6.90	6.65	9.13	7.55	7.00	8.00	10.63	11.00	5.04	5.10
6	6.21	7.80	6.05	6.55	8.80	7.60	6.82	7.80	11.30	10.95	5.10	5.15
7	6.42	7.40	6.00	6.40	8.45	7.70	7.21	8.63	11.72	10.20	5.08	5.17
8	6.23	7.08	8.00	6.34	8.08	7.90	7.25	8.65	11.66	8.60	5.08	5.18
9	6.17	6.90	7.50	6.34	7.58	8.00	7.90	9.25	12.13	8.70	5.10	5.20
10	5.95	6.82	7.20	6.49	7.18	8.38	7.88	9.35	12.13	8.40	5.11	5.20
11	5.90	6.78	7.37	6.57	7.35	8.15	7.23	9.99	12.21	8.33	5.12	5.20
12	6.00	6.79	7.20	7.03	7.30	8.13	7.15	10.02	12.31	8.00	5.10	5.21
13	6.11	6.81	7.07	6.95	7.05	8.11	6.87	9.83	12.28	7.30	5.09	5.21
14	6.30	6.84	7.10	6.86	6.95	8.07	7.35	9.70	12.13	7.70	5.05	5.22
15	6.28	6.40	7.10	6.77	6.75	7.88	7.32	9.73	12.20	6.05	5.05	5.22
16	6.32	5.50	6.98	6.70	6.83	7.50	7.00	9.86	12.54	5.53	5.05	5.25
17	6.18	7.50	6.90	6.60	6.92	7.56	6.65	10.57	12.67	6.19	5.05	5.25
18	5.99	7.58	6.70	6.32	6.93	7.61	6.38	10.70	12.90	5.73	5.05	5.25
19	5.73	6.90	6.70	6.10	6.93	7.75	6.33	10.95	13.32	5.55	5.05	5.32
20	5.80	6.50	6.50	6.45	6.75	7.80	6.46	12.47	13.73	5.37	5.05	5.67
21	6.38	7.00	6.50	6.73	6.60	7.83	6.76	9.90	13.91	5.20	5.07	5.67
22	6.60	6.25	6.52	6.72	6.45	7.67	6.55	10.80	14.37	5.05	5.04	5.60
23	6.51	6.89	6.59	6.58	6.33	8.60	6.86	10.44	14.30	5.05	5.06	5.44
24	6.40	7.30	6.99	6.46	6.35	6.80	6.92	10.15	13.86	5.05	5.05	5.88
25	6.40	7.80	6.88	6.52	6.37	6.38	6.91	9.80	14.10	5.00	5.05	5.88
26	6.42	7.30	6.90	7.81	6.51	7.40	6.54	9.70	14.18	4.98	5.05	5.72
27	6.39	7.60	6.96	8.83	6.85	7.21	6.44	9.95	14.07	4.94	5.05	5.76
28	6.45	7.51	6.95	8.84	6.76	6.93	6.48	10.18	13.53	4.93	5.07	5.82
29	6.46	7.55	6.82	8.58	......	6.95	6.90	10.63	12.22	4.92	5.05	5.83
30	6.47	7.50	6.87	8.68	......	7.15	7.80	10.75	11.20	4.95	5.06	5.80
31	6.47	......	6.90	10.25	......	7.21	......	10.37	......	5.01	5.07	......

Daily discharge, in second-feet, of Snake River at King Hill, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	6,860	8,960	11,800	9,600	18,700	9,470	10,900	13,000	19,900	24,700	5,630	5,790
2	6,750	8,900	11,100	9,420	17,800	9,600	10,600	13,600	19,000	25,200	5,690	5,790
3	6,400	8,360	10,900	9,500	15,500	9,660	8,720	13,600	19,200	24,900	5,810	5,790
4	7,200	8,040	10,900	9,710	17,500	10,200	10,800	13,800	22,000	24,600	5,810	5,850
5	7,250	9,200	10,300	9,600	17,400	12,200	10,600	13,500	22,900	24,300	5,770	5,890
6	8,440	12,900	8,040	9,340	16,200	12,300	10,100	12,900	25,500	24,100	5,890	6,000
7	8,980	11,700	7,910	8,930	15,000	12,600	11,200	15,600	27,100	21,200	5,850	6,040
8	8,490	10,800	13,500	8,770	13,800	13,200	11,300	15,700	26,900	15,500	5,850	6,060
9	8,340	10,300	12,000	8,770	12,200	13,500	13,200	17,800	28,800	15,800	5,890	6,100
10	7,790	10,100	11,100	9,170	11,100	14,800	13,200	18,100	28,800	14,800	5,910	6,100
11	7,670	10,000	11,600	9,390	11,600	14,000	11,200	20,500	29,100	14,600	5,930	6,100
12	7,910	10,000	11,100	10,700	11,400	13,900	11,000	20,600	29,500	13,500	5,890	6,120
13	8,180	10,000	10,800	10,400	10,700	13,900	10,200	19,900	29,400	11,400	5,870	6,120
14	8,670	10,100	10,900	10,200	10,400	13,800	11,600	19,400	28,800	12,600	5,790	6,140
15	8,620	8,930	10,900	9,940	9,880	13,200	11,500	19,500	29,100	8,040	5,790	6,140
16	8,720	6,750	10,500	9,740	10,100	12,000	10,600	20,000	30,500	6,820	5,790	6,200
17	8,360	12,000	10,300	9,470	10,400	12,200	9,600	22,600	31,000	8,380	5,790	6,200
18	7,890	12,200	9,740	8,720	10,400	12,300	8,880	23,100	31,900	7,270	5,790	6,200
19	7,270	10,300	9,740	8,160	10,400	12,800	8,750	24,100	33,700	6,860	5,790	6,350
20	7,430	9,200	9,200	9,060	9,880	12,900	9,090	30,200	35,400	6,460	5,790	7,130
21	8,880	10,600	9,200	9,820	9,470	13,000	9,910	20,100	36,100	6,100	5,830	7,130
22	9,470	8,540	9,250	9,800	9,060	12,500	9,340	23,500	38,100	5,790	5,770	6,970
23	9,230	10,300	9,440	9,420	8,750	15,500	10,200	22,100	37,800	5,790	5,810	6,620
24	8,930	11,400	10,600	9,090	8,800	10,000	10,400	21,000	35,900	5,790	5,790	7,620
25	8,930	12,900	10,200	9,250	8,850	8,880	10,300	19,800	36,900	5,690	5,790	7,620
26	8,980	11,400	10,300	12,900	9,230	11,700	9,310	19,400	37,300	5,650	5,790	7,250
27	8,900	12,300	10,500	16,300	10,200	11,200	9,040	20,300	36,800	5,570	5,790	7,340
28	9,060	12,000	10,400	16,300	9,910	10,400	9,150	21,200	34,500	5,550	5,830	7,480
29	9,090	12,200	10,100	15,400	....	10,400	10,300	22,900	29,200	5,530	5,790	7,500
30	9,120	12,000	10,200	15,800	....	11,000	12,900	23,300	25,100	5,590	5,810	7,430
31	9,120	....	10,300	21,400	....	11,200	....	21,900	....	5,710	5,830	....

Note.—Discharge determined from a well-defined rating curve.

Monthly discharge of Snake River at King Hill, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	9,470	6,400	8,290	510,000	A.
November	12,900	6,750	10,400	619,000	A.
December	13,500	7,910	10,400	640,000	A.
January	21,400	8,160	10,800	664,000	A
February	18,700	8,750	12,000	666,000	A.
March	15,500	8,880	12,100	744,000	A.
April	13,200	8,720	10,500	625,000	A.
May	30,200	12,900	19,500	1,200,000	A.
June	38,100	19,000	29,900	1,780,000	A.
July	25,200	5,530	12,100	744,000	A.
August	5,930	5,630	5,810	357,000	A.
September	7,620	5,790	6,500	387,000	A.
The year	38,100	5,530	12,400	8,840,000	

SNAKE RIVER AT WEISER, IDAHO.

Location.—In sec. 31, T. 11 N., R. 5 W., Boise meridian, about 200 yards downstream from the wagon bridge at Weiser, and about 1 mile below the mouth of Weiser River.

Records available.—October 8, 1910, to September 30, 1911. The United States Weather Bureau has obtained gage heights at a gage about half a mile above the Survey gage for parts of almost every year since 1895.

Gage.—Sloping gage on the right bank; datum unchanged.

Channel.—Rocks and coarse gravel; should be fairly permanent.

Discharge measurements.—Made from a cable a few feet below gage.

Diversions.—Some water for irrigation diverted between King Hill and Weiser, but almost entirely by pumping.

Accuracy.—Conditions for determining flow good; records reliable.

Discharge measurements of Snake River at Weiser, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 5	Purton and Crandall	6.25	12,600	June 6	J. C. Dort	11.92	51,000
5	.....do	6.25	12,600	10	.....do	13.02	61,400
Feb. 2[a]	Lynn Crandall	12.1	55,200	22	O. W. Hartwell	13.67	67,600
16	.....do	6.75	15,300	July 10	.....do	8.54	24,900
Mar. 14	.....do	9.06	30,100	21	.....do	5.86	10,500
Apr. 22	A. B. Purton	7.50	19,500	27	.....do	5.29	8,120
May 31	J. C. Dort	10.55	40,700	Sept. 10	Lynn Crandall	5.01	6,380

[a] Surface velocities observed and coefficient of 0.89 used to reduce to mean velocity.

Daily gage height, in feet, of Snake River at Weiser, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	6.0	7.4	6.4	11.1	6.3	9.5	9.1	10.7	11.8	5.1	4.9
2	....	6.0	7.4	6.3	12.0	6.4	9.9	9.0	10.9	11.0	5.1	4.9
3	....	6.0	7.2	6.3	11.6	6.4	10.1	9.2	10.9	10.6	5.1	4.9
4	....	6.0	8.4	6.2	10.2	6.4	10.0	9.5	11.2	10.4	5.1	4.9
5	....	5.9	8.0	6.2	9.2	6.9	9.7	9.7	11.6	10.4	5.1	4.8
6	....	5.8	7.4	6.4	8.9	7.3	9.4	10.3	11.9	10.2	5.1	4.8
7	....	5.8	7.2	6.4	8.7	8.8	9.0	10.6	12.0	10.1	5.1	4.8
8	5.7	6.0	7.0	6.5	8.4	10.5	8.6	10.4	12.5	9.9	5.1	4.9
9	5.9	6.7	6.5	6.4	8.1	10.3	8.6	10.3	13.2	9.2	5.1	5.0
10	5.9	6.7	6.5	6.2	7.7	10.0	8.8	10.4	13.0	8.4	5.1	5.0
11	5.8	6.7	6.5	6.2	7.5	9.7	9.1	10.3	12.9	8.3	5.1	5.0
12	5.7	6.6	7.3	6.1	7.2	9.5	8.8	10.1	13.0	8.1	5.1	5.0
13	5.6	6.8	7.3	6.3	7.1	9.3	8.5	10.2	13.3	7.7	5.1	5.0
14	5.6	6.7	7.4	6.4	7.1	9.0	8.2	10.2	13.6	7.7	5.1	5.0
15	5.7	6.6	7.1	6.6	6.9	8.9	8.1	10.2	13.6	7.1	5.1	5.0
16	5.7	6.5	6.9	6.6	6.8	9.0	7.9	10.5	13.6	7.4	5.0	5.0
17	5.9	6.4	6.9	6.4	6.7	9.0	8.0	11.3	13.5	7.1	5.0	5.0
18	6.0	6.1	6.8	6.3	6.6	9.1	7.8	11.5	13.5	6.3	5.0	5.0
19	6.0	6.3	6.8	6.3	6.6	9.2	7.7	11.8	13.5	6.1	5.0	5.0
20	5.9	6.8	6.6	6.3	6.6	9.2	7.6	11.9	13.6	6.1	5.0	5.1
21	5.8	6.7	6.5	6.2	6.6	9.5	7.6	11.6	13.7	5.8	5.0	5.1
22	5.7	6.7	6.4	6.2	6.6	9.7	7.5	12.1	13.6	5.7	5.0	5.1
23	5.7	6.7	6.4	6.2	6.5	10.0	7.7	11.1	13.6	5.5	5.0	5.2
24	6.0	7.1	6.4	6.4	6.5	10.4	7.7	11.4	13.6	5.5	5.0	5.3
25	6.0	7.8	6.4	6.3	6.4	10.8	8.0	11.2	13.3	5.4	5.0	5.2
26	6.0	7.2	6.5	6.4	6.3	10.8	8.5	11.0	12.7	5.3	5.0	5.2
27	6.0	7.3	6.6	6.4	6.3	9.5	8.9	10.7	12.5	5.3	5.0	5.3
28	6.0	7.0	6.5	6.6	6.3	8.9	9.3	10.5	12.5	5.3	5.0	5.3
29	6.0	7.2	6.5	7.5	....	8.8	9.4	10.2	12.6	5.2	5.0	5.3
30	6.0	7.5	6.6	7.8	....	8.6	9.2	10.3	12.3	5.2	5.0	5.3
31	6.0	....	6.5	8.9	....	8.7	....	10.5	....	5.1	5.0	....

Daily discharge, in second-feet, of Snake River at Weiser, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	11,300	18,900	13,400	44,600	12,800	32,400	29,600	41,400	50,400	7,040	6,200
2	....	11,300	18,900	12,800	52,100	13,400	35,300	28,900	43,000	43,800	7,040	6,200
3	....	11,300	17,800	12,800	48,700	13,400	36,800	30,200	43,000	40,600	7,040	6,200
4	....	11,300	25,000	12,300	37,500	13,400	36,000	32,400	45,400	39,000	7,040	6,200
5	....	10,800	22,500	12,300	30,200	16,100	33,800	33,800	48,700	39,000	7,040	5,800
6	....	10,300	18,900	13,400	28,200	18,300	31,600	38,300	51,300	37,500	7,040	5,800
7	....	10,300	17,800	13,400	26,900	27,500	28,900	40,600	52,100	36,800	7,040	5,800
8	9,780	11,300	16,600	13,900	25,000	39,800	26,200	39,000	56,500	35,300	7,040	6,200
9	10,800	15,000	13,900	13,400	23,100	38,300	26,200	38,300	62,700	30,200	7,040	6,620
10	10,800	15,000	13,900	12,300	20,700	36,000	27,500	39,000	60,900	25,000	7,040	6,620
11	10,300	15,000	13,900	12,300	19,500	33,800	29,600	38,300	60,000	24,300	7,040	6,620
12	9,780	14,400	18,300	11,800	17,800	32,400	27,500	36,800	60,900	23,100	7,040	6,620
13	9,300	15,500	18,300	12,800	17,200	30,900	25,600	37,500	63,600	20,700	7,040	6,620
14	9,300	15,000	18,900	13,400	17,200	28,900	23,700	37,500	66,300	20,700	7,040	6,620
15	9,780	14,400	17,200	14,400	16,100	28,200	23,100	37,500	66,300	17,200	7,040	6,620
16	9,780	13,900	16,100	14,400	15,500	28,900	21,900	39,800	66,300	18,900	6,620	6,620
17	10,800	13,400	16,100	13,400	15,000	28,900	22,500	46,200	65,400	17,200	6,620	6,620
18	11,300	11,800	15,500	12,800	14,400	29,600	21,300	47,900	65,400	12,800	6,620	6,620
19	11,300	12,800	15,500	12,800	14,400	30,200	20,700	50,400	65,400	11,800	6,620	6,620
20	10,800	15,500	14,400	12,800	14,400	30,200	20,100	51,300	66,300	11,800	6,620	7,040
21	10,300	15,000	13,900	12,300	14,400	32,400	20,100	48,700	67,200	10,300	6,620	7,040
22	9,780	15,000	13,400	12,300	14,400	33,800	19,500	53,000	66,300	9,780	6,620	7,040
23	9,780	15,000	13,400	12,300	13,900	36,000	20,700	44,600	66,300	8,820	6,620	7,460
24	11,300	17,200	13,400	13,400	13,900	39,000	20,700	47,100	66,300	8,820	6,620	7,900
25	11,300	21,300	13,400	12,800	13,400	42,200	22,500	45,400	63,600	8,360	6,620	7,460
26	11,300	17,800	13,900	13,400	12,800	42,200	25,600	43,800	58,300	7,900	6,620	7,460
27	11,300	18,300	14,400	13,400	12,800	32,400	28,200	41,400	56,500	7,900	6,620	7,900
28	11,300	16,600	13,900	14,400	12,800	28,200	30,900	39,800	56,500	7,900	6,620	7,900
29	11,300	17,800	13,900	19,500	....	27,500	31,600	37,500	57,400	7,460	6,620	7,900
30	11,300	19,500	14,400	21,300	....	26,200	30,200	38,300	54,700	7,460	6,620	7,900
31	11,300	....	13,900	28,200	....	26,900	....	39,800	....	7,040	6,620	....

NOTE.—Discharge determined from a rating curve that is very well defined above 6,600 second-feet.

Monthly discharge of Snake River at Weiser, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October 8-31	11,300	9,300	10,600	505,000	A.
November	21,300	10,300	14,400	857,000	A.
December	25,000	13,400	16,100	990,000	A.
January	28,200	11,800	14,000	861,000	A.
February	52,100	12,800	21,700	1,210,000	A.
March	42,200	12,800	29,000	1,780,000	A.
April	36,800	19,500	26,700	1,590,000	A.
May	53,000	28,900	40,400	2,480,000	A.
June	67,200	41,400	58,800	3,500,000	A.
July	50,400	7,040	20,900	1,290,000	A.
August	7,040	6,620	6,820	419,000	A.
September	7,900	5,800	6,810	405,000	A.
The period				15,900,000	

SNAKE RIVER NEAR BURBANK, WASH.

Location.—At the head of Fivemile Rapids, 1,500 feet above the intake of the power canal about 1¾ miles above the power plant of the Burbank Power & Water Co., about 5 miles east of Burbank and 5¼ miles above the mouth of the river.

Records available.—September 1, 1909, to September 30, 1911; fragmentary gage records October 2, 1907, to August 31, 1909. Readings on a gage below the rapids in the tailrace of the power plant, June 24, 1909, to October 31, 1910.

Drainage area.—108,600 square miles.

Gage.—Inclined staff on right bank reading from 334 to 352 feet, sea-level datum. The datum of the published gage heights is 300 feet above sea level. The gage in the tailrace of the power plant reads sea-level elevation also.

Channel.—The control for the gage is the head of the rapids. The plotting of the discharge measurements indicates that the control has remained practically constant since about August, 1909. During that month a wing dam was constructed at the head of the power canal which raised the water at the gage a small amount.

Discharge measurements.—Made from a bridge on the Pendleton branch of the Northern Pacific Railway about one-fourth mile above the mouth of the stream. A gage reading to 28 feet is attached to the bridge, but is affected by backwater from the Columbia.

Winter flow.—Not affected by ice.

Accuracy.—Rating curve well defined between 20,000 and 240,000 second-feet. Records for September and October, 1909, may have been affected by construction work on the wing dam, and their accuracy has been reduced.

Cooperation.—Gage-height record furnished by the Burbank Power & Water Co.

Discharge measurements of Snake River near Burbank, Wash., in 1909-1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
1909.				1910.			
Oct. 19	G. L. Parker	36.6	26,800	Sept. 24	F. C. Ebert	35.6	19,400
				Oct. 28	Ebert and Storey	36.6	26,100
1910.							
Feb. 25[a]	Howard Kimble	37.2	24,900	1911.			
Mar. 30	H. D. McGlashan	[b] 43.6	130,000	Sept. 2[c]	Charles Leidl	35.3	16,200
May 10	McGlashan and Ebert	45.6	178,000				
June 28	H. H. McGlashan	38.0	41,500				

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[a] High wind upstream and shore ice, measurement doubtful.
[b] Gage height estimated from reading at lower end of headrace of power plant. Probably correct within 0.1 foot.
[c] Squally upstream wind.

Daily gage height, in feet, of Snake River near Burbank, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	35.2	36.2	37.8	36.7	37.6	36.4	39.9	41.9	42.9	43.9	36.6	35.2
2	35.1	36.1	38.0	36.6	38.5	36.0	40.3	41.7	43.7	43.9	36.4	35.1
3	35.4	36.0	38.0	36.5	40.1	36.1	41.3	41.8	44.9	43.5	36.4	35.1
4	35.7	36.2	38.0	36.4	40.6	36.2	41.6	42.2	45.3	42.7	36.2	35.1
5	35.9	36.2	38.1	36.2	40.0	36.4	41.5	42.5	45.7	42.3	36.6	31.1
6	37.2	36.3	39.0	36.3	38.5	36.5	41.2	43.4	46.0	42.0	36.5	35.1
7	36.7	36.4	38.9	36.4	38.3	36.8	41.0	44.4	45.8	41.8	36.2	35.4
8	36.3	36.4	38.5	36.6	38.0	37.4	40.8	44.2	45.7	41.6	36.0	35.7
9	36.3	36.3	38.2	36.7	38.0	38.5	39.9	43.8	46.7	41.5	36.0	36.0
10	36.3	37.6	38.0	36.8	37.9	39.7	39.7	43.5	47.0	41.2	35.9	35.8
11	36.2	37.8	37.9	36.7	37.8	39.7	39.9	43.1	46.6	40.7	36.0	35.7
12	36.2	38.2	37.7	36.6	37.7	39.7	40.0	42.7	46.6	40.1	36.0	35.5
13	36.3	38.8	37.8	36.6	37.4	39.3	40.0	42.5	47.2	39.8	35.9	35.5
14	36.0	38.7	37.8	36.5	37.4	39.2	39.8	42.4	48.0	39.6	35.9	35.4
15	36.0	38.3	37.6	36.2	37.2	39.2	39.5	42.5	48.4	39.2	35.9	35.4
16	36.1	38.0	37.6	36.4	37.2	39.1	39.1	42.5	48.1	39.0	35.9	35.3
17	36.2	37.8	37.4	36.5	37.1	39.1	39.0	43.3	47.8	38.7	35.8	35.2
18	36.1	37.5	37.2	36.9	36.9	39.0	38.9	44.3	47.4	38.5	35.7	35.4
19	36.1	37.4	37.1	37.2	36.8	39.8	39.3	44.4	47.0	38.4	35.7	35.4
20	36.5	37.2	37.1	37.3	36.7	40.0	39.4	44.6	46.7	38.2	35.5	35.3
21	36.65	37.1	37.0	37.4	36.8	40.3	39.3	44.3	46.6	38.0	35.5	35.4
22	36.5	37.9	36.9	37.1	36.6	40.5	39.4	44.0	46.5	38.0	35.4	35.3
23	36.3	39.2	36.9	37.1	36.6	40.8	39.6	43.6	46.3	37.6	35.4	35.2
24	36.1	38.7	36.7	36.9	36.5	41.3	40.0	43.7	45.7	37.4	35.4	35.2
25	36.0	38.5	36.7	36.6	36.5	41.5	40.3	43.4	45.6	37.1	35.3	35.3
26	36.0	38.3	36.8	36.3	36.6	41.3	41.2	43.5	45.3	36.9	35.3	35.5
27	36.2	38.1	36.9	36.4	36.6	41.0	41.6	43.4	44.6	36.8	35.3	35.6
28	36.6	38.0	36.8	36.2	36.5	40.9	42.1	43.2	43.7	37.1	35.3	35.6
29	36.5	37.8	36.8	36.4	......	40.0	42.3	42.9	44.1	36.8	35.2	35.5
30	36.4	37.8	36.7	36.4	......	39.8	42.1	42.6	44.2	36.9	35.2	35.6
31	36.3	......	36.6	36.8	......	39.7	......	42.5	......	36.7	35.2	......

NOTE.—Add 300 feet to reduce to sea-level datum.

Daily discharge, in second-feet, of Snake River near Burbank, Wash., for Sept. 1909.

Day.	Sept.	Day.	Sept.	Day.	Sept.
1	19,300	11	27,200	21	26,400
2	24,700	12	26,400	22	27,200
3	24,000	13	28,100	23	28,100
4	23,000	14	29,100	24	28,100
5	24,700	15	29,100	25	26,400
6	26,400	16	29,100	26	27,200
7	29,100	17	27,200	27	26,400
8	26,400	18	28,100	28	27,200
9	26,400	19	27,200	29	26,400
10	26,400	20	26,400	30	25,500

Daily discharge, in second-feet, of Snake River near Burbank, Wash., for 1909–1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1909–10.												
1	30,000	27,200	64,500	32,900	38,200	69,000	116,000	198,000	124,000	37,100	17,400	14,000
2	30,000	27,200	63,000	35,000	38,200	124,000	108,000	184,000	132,000	36,100	16,700	14,000
3	29,100	29,100	58,700	37,100	34,000	205,000	118,000	171,000	134,000	35,000	16,700	14,000
4	29,100	42,800	49,100	31,900	31,900	237,000	120,000	157,000	130,000	32,900	16,100	14,500
5	27,200	41,700	49,100	32,900	30,000	242,000	118,000	155,000	120,000	31,900	15,600	14,500
6	27,200	39,400	45,300	32,900	29,100	201,000	116,000	162,000	110,000	31,000	15,000	14,500
7	28,100	38,200	41,700	34,000	27,200	166,000	122,000	162,000	105,000	31,000	15,000	14,000
8	29,100	37,100	41,700	31,900	27,200	147,000	120,000	160.000	101,000	30,000	15,000	13,500
9	30,000	35,000	42,800	31,000	27,200	128,000	120,000	164,000	101,000	29,100	15,000	13,000
10	29,100	34,000	44,000	30,000	27,200	118,000	132,000	175,000	97,400	27,200	15,000	13,500
11	30,000	35,000	45,300	40,500	28,100	114,000	147,000	191,000	88,600	26,400	15,000	13,500
12	30,000	36,100	46,500	45,300	29,100	112,000	168,000	213,000	85,200	25,500	14,500	13,500
13	29,100	35,000	45,300	40,500	33,600	114,000	194,000	205,000	83,500	24,700	14,200	13,500
14	28,100	35,000	45,300	40,500	38,200	118,000	194,000	194,000	80,100	23,800	14,000	13,000
15	28,100	34,000	42,800	31,000	37,100	124,000	184,000	187,000	76,900	23,000	13,500	13,000
16	28,100	31,900	40,500	29,100	36,100	134,000	168,000	177,000	73,700	25,500	13,500	13,000
17	28,100	30,000	41,700	29,100	34,000	142,000	153,000	164,000	67,500	24,700	13,000	13,500
18	26,400	30,000	39,400	36,100	31,900	149,000	151,000	153,000	67,500	23,900	13,500	15,000
19	26,400	31,000	38,200	40,500	31,900	151,000	149,000	149,000	64,500	23,100	13,500	16,100
20	25,500	35,000	38,200	38,200	31,900	173,000	162,000	149,000	60,100	22,300	13,500	18,700
21	26,400	53,100	35,000	38,200	31,900	227,000	182,000	142,000	55,900	21,500	13,000	19,300
22	28,100	46,500	32,900	38,200	31,000	237,000	196,000	132,000	54,500	21,500	12,600	19,300
23	29,100	47,800	31,400	36,100	31,900	252,000	187,000	128,000	51,700	21,500	12,200	18,700
24	28,100	70,500	30,000	45,300	34,000	252,000	184,000	128,000	49,100	21,500	12,200	18,000
25	28,100	95,600	29,100	47,800	31,900	224,000	189,000	132,000	46,500	20,800	12,200	19,300
26	27,200	116,000	25,500	46,500	36,100	196,000	203,000	138,000	44,000	20,000	11,800	18,000
27	27,200	101,000	28,700	44,000	47,800	173,000	227,000	142,000	41,700	19,300	11,800	16,700
28	27,200	81,800	31,800	44,000	76,900	161,000	232,000	134,000	40,500	18,700	12,200	16,700
29	26,400	70,500	35,000	44,000	....	149,000	230,000	144,000	40,500	18,000	12,200	16,700
30	26,400	66,000	32,900	40,500	....	138,000	217,000	130,000	39,400	17,400	12,600	16,100
31	27,200	....	30,000	38,200	....	127,000	....	124,000	....	17,400	13,500	....
1910–11.												
1	16,100	23,000	38,200	27,200	36,100	24,700	66,000	99,200	118,000	138,000	26,400	16,100
2	15,600	22,300	40,500	26,400	46,500	21,500	72,100	95,600	134,000	138,000	24,700	15,600
3	17,400	21,500	40,500	25,500	69,000	22,300	88,600	97,400	160,000	130,000	24,700	15,600
4	19,300	23,000	40.500	24,700	76,900	23,000	93,900	105,000	168,000	114,000	23.000	15,600
5	20,800	23,000	41,700	23,000	67,500	24,700	92,100	110,000	177,000	107,000	26.400	15.600
6	31,900	23,800	53,100	23,800	46,500	25,500	86,900	128,000	184,000	101,000	25,500	15,600
7	27,200	24,700	51,700	24,700	44,000	28,100	83,500	149,000	180,000	97,400	23,000	17,400
8	23,800	24,700	46,500	26,400	40,500	34,000	80,100	144.000	177,000	93,900	21,500	19,300
9	23,800	23,800	42,800	27,200	40,500	46,500	66,000	136,000	201,000	92,100	21,500	21,500
10	23,800	36,100	40,500	28,100	39,400	63,000	63,000	130,000	208,000	86,900	20,800	20,000
11	23,000	38,200	39,400	27,200	38,200	63,000	66,000	122,000	198,000	78,500	21,500	19,300
12	23,000	42,800	37,100	26,400	37,100	63,000	67,500	114,000	198,000	69,000	21,500	18.000
13	23,800	50,400	38,200	26,400	34,000	57,300	67,500	110,000	213,000	64,500	20,800	18,000
14	21,500	49,100	38,200	25,500	34,000	55,900	64,500	108,000	232,000	61,600	20,800	17.400
15	21,500	44,000	36,100	23,000	31,900	55,900	60,100	110,000	242,000	55,900	20,800	17,400
16	22,300	40,500	36,100	24,700	31,900	54,500	54,500	110,000	235,000	53.100	20,800	16,700
17	23,000	38,200	34,000	25,500	31,000	54,500	53,100	126,000	227,000	49,100	20,000	16,100
18	22,300	35,000	31,900	29,100	29,100	53,100	51,700	147,000	217,000	46,500	19,300	17,400
19	22,300	34,000	31,000	31,900	28,100	64.500	57,300	149,000	208,000	45,300	19,300	17,400
20	25,500	31,900	31,100	32,900	27,200	67,500	58,700	153,000	201,000	42.800	18,000	16,700
21	26,800	31,000	30,000	34,000	28,100	72,100	57,300	147,000	198,000	40,500	18,000	17,400
22	25,500	39,400	29,100	31,000	26,400	75,200	58,700	140,000	196,000	40,500	17,400	16,700
23	23,800	55,900	29,100	31,000	26,400	80,100	61,600	132,000	191,000	36,100	17,400	16,100
24	22,300	49,100	27,200	29,100	25,500	88,600	67,500	134,000	177,000	34,000	17,400	16,100
25	21,500	46,500	27,200	26,400	25,500	92,100	72,100	128,000	175,000	31,000	16,700	16,700
26	21,500	44,000	28,100	23,800	26,400	88,600	86,900	130,000	168,000	29,100	16,700	18,000
27	23,000	41,700	29,100	24,700	26,400	83,500	93,900	128,000	153,000	28,100	16,700	18,700
28	26,400	40,500	28,100	23,000	25,500	81,800	103,000	124,000	134,000	31,000	16,700	18,700
29	25,500	38,200	28,100	24,700	....	67,500	107,000	118,000	142,000	28,100	16,100	18,000
30	24,700	38,200	27,200	24,700	....	64,500	103,000	112,000	144,000	29,100	16,100	18,700
31	23,800	....	26,400	28,100	....	63,000	....	110,000	....	27,200	16,100	....

NOTE.—Discharges for Sept. 1, 1909, to Sept. 30, 1911, were determined from a rating curve well defined between 20,000 and 240,000 second-feet.

Monthly discharge of Snake River near Burbank, Wash., for 1909–1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1909.					
September	29,100	19,300	26,600	1,580,000	B.
1909–10.					
October	30,000	25,500	28,100	1,730,000	B.
November	116,000	27,200	47,800	2,840,000	A.
December	64,500	25,500	40,800	2,510,000	A.
January	47,800	29,100	37,500	2,310,000	A.
February	76,900	27,200	34,400	1,910,000	A.
March	252,000	69,000	165,000	10,100,000	A.
April	232,000	108,000	164,000	9,760,000	A.
May	213,000	124,000	159,000	9,780,000	A.
June	134,000	39,400	78,900	4,690,000	A.
July	37,100	17,400	25,200	1,550,000	A.
August	17,400	11,800	13,900	855,000	B.
September	19,300	13,000	15,400	916,000	B.
The year	252,000	11,800	67,600	49,000,000	
1910–11.					
October	31,900	15,600	23,000	1,410,000	A.
November	55,900	21,500	35,800	2,130,000	A.
December	53,100	28,400	35,400	2,180,000	A.
January	34,000	23,000	26,800	1,650,000	A.
February	76,900	25,500	37,100	2,060,000	A.
March	92,100	21,500	56,800	3,490,000	A.
April	107,000	51,700	73,500	4,370,000	A.
May	153,000	95,600	124,000	7,620,000	A.
June	242,000	118,000	185,000	11,000,000	A.
July	138,000	27,200	65,100	4,000,000	A.
August	26,400	16,100	20,200	1,240,000	B.
September	21,500	15,600	17,400	1,040,000	B.
The year	242,000	15,600	58,300	42,200,000	

HENRYS FORK[1] AT WARM RIVER, IDAHO.

Location.—In sec. 12, T. 9 N., R. 43 E. Boise meridian, about half a mile from the Warm River railroad station, and about 300 yards above the mouth of Warm River; above all main tributaries.

Records available.—September 3, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on left bank; datum unchanged.

Channel.—Gravel and sand; moss; bottom shifts slightly.

Discharge measurements.—Made from a cable at the gage.

Diversions.—Practically no water diverted above the station; no storage yet provided.

Winter flow.—Relation between gage heights and discharge not appreciably affected by ice.

Accuracy.—Records good, though determination of daily discharge may be approximate for short periods during which moss exists in the channel.

Discharge measurements of Henrys Fork at Warm River, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 2	O. W. Hartwell	4.49	892	July 19[a]	H. L. Stoner	4.82	1,160
May 13	.....do	6.30	2,260	Aug. 12[a]	.....do	4.70	993
June 4	A. B. Purton	6.21	2,160	Sept. 14[a]	.....do	4.63	960
14	H. L. Stoner	5.92	1,980				

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[1] Formerly called North Fork of Snake River.

[a] Moss in channel.

Daily gage height, in feet, of Henrys Fork at Warm River, Idaho, for the year ending Sept. 30, 1911.

[Mrs. Josephine Stone, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	4.6	4.5	4.5	4.3	4.5	4.3	4.4	6.2	5.5	5.5	4.75	4.60
2	4.6	4.5	4.5	4.3	4.5	4.3	4.5	6.1	5.8	5.4	4.75	4.60
3	4.6	4.5	4.5	....	4.5	4.5	4.5	6.2	6.0	5.35	4.75	4.60
4	4.6	4.5	4.5	4.4	4.5	4.5	4.5	6.2	6.2	....	4.75	4.60
5	4.6	4.5	4.5	....	4.3	4.5	4.5	6.8	6.4	5.2	4.75	4.70
6	4.6	4.5	4.5	4.5	4.3	4.5	4.5	7.3	6.2	5.15	4.75	4.70
7	4.6	4.6	4.5	4.5	4.3	4.5	4.5	6.6	6.0	5.1	4.75	4.70
8	4.6	4.6	4.5	4.5	4.3	4.5	4.5	6.5	6.1	5.05	4.70	4.60
9	4.6	4.6	4.5	4.5	4.3	4.4	4.5	6.7	6.1	5.0	4.70	4.60
10	4.6	4.6	4.5	....	4.3	4.4	4.5	6.6	6.1	4.95	4.70	4.60
11	4.6	4.6	4.5	4.4	4.3	4.4	4.5	6.2	6.1	4.9	4.70	4.60
12	4.6	4.7	4.5	....	4.3	4.4	4.6	6.1	5.9	4.85	4.70	4.60
13	4.6	4.65	4.4	4.4	4.3	4.4	4.6	6.0	5.9	4.85	4.70	4.60
14	4.6	4.6	4.4	4.4	4.3	4.4	4.6	....	5.9	4.85	4.70	4.60
15	4.6	4.6	4.4	4.4	4.3	4.4	4.7	....	5.95	4.85	4.65	4.60
16	4.65	4.6	4.4	4.4	4.3	4.4	4.8	6.3	5.8	4.85	4.65	4.60
17	4.65	4.6	4.4	4.4	4.3	4.4	4.8	6.6	5.7	4.85	4.65	4.60
18	4.65	4.6	4.5	4.3	4.3	4.4	4.9	6.4	5.7	4.85	4.65	4.60
19	4.65	4.6	4.5	4.3	4.3	4.4	5.2	6.3	5.6	4.8	4.65	4.60
20	4.65	4.6	4.5	4.3	4.3	4.4	5.0	6.1	5.6	4.8	4.65	4.60
21	4.65	4.6	4.5	4.3	4.3	4.4	5.1	5.8	5.8	4.8	4.65	4.60
22	4.65	4.6	4.5	4.3	4.3	4.4	5.1	5.8	5.9	4.8	4.65	4.55
23	4.55	4.6	4.5	4.3	4.3	4.4	5.1	5.8	5.6	4.75	4.65	4.55
24	4.55	4.6	4.5	4.3	4.3	4.5	5.1	5.8	5.5	4.75	4.65	4.60
25	4.55	4.6	4.5	4.5	4.3	4.5	5.4	5.9	5.25	4.8	4.65	4.60
26	4.55	4.65	4.5	4.6	....	4.5	5.5	6.1	5.3	4.8	4.65	4.60
27	4.55	4.6	4.5	4.6	....	4.4	5.6	6.0	5.45	4.75	4.65	4.60
28	4.55	4.6	4.4	4.6	....	4.4	5.9	5.8	5.45	4.75	4.60	4.60
29	4.55	4.5	4.4	4.6	....	4.4	5.9	5.7	5.45	4.75	4.60	4.60
30	4.55	4.5	4.3	4.6	....	4.4	6.0	5.5	5.5	4.75	4.60	4.60
31	4.55	....	4.3	4.6	....	4.4	....	5.5	....	4.75	4.60	....

NOTE.—Water away from gage Feb. 26 to 28.

Daily discharge, in second-feet, of Henrys Fork at Warm River, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1,050	990	990	880	990	880	935	2,180	1,620	1,620	1,080	940
2	1,050	990	990	880	990	880	990	2,100	1,850	1,560	1,080	940
3	1,050	990	990	908	990	990	990	2,180	2,010	1,520	1,070	940
4	1,050	990	990	935	990	990	990	2,180	2,180	1,470	1,070	940
5	1,050	990	990	962	880	990	990	2,720	2,360	1,420	1,060	995
6	1,050	990	990	990	880	990	990	3,100	2,180	1,390	1,060	995
7	1,050	1,050	990	990	880	990	990	2,540	2,010	1,360	1,050	995
8	990	1,050	990	990	880	990	990	2,440	2,100	1,320	1,020	940
9	1,050	1,000	990	990	880	935	990	2,630	2,100	1,290	1,010	940
10	1,050	1,050	990	962	880	935	930	2,540	2,100	1,260	1,000	940
11	1,050	1,050	990	935	880	935	990	2,180	2,100	1,220	1,000	940
12	1,050	1,110	990	935	880	935	1,040	2,100	1,930	1,200	995	940
13	1,050	1,080	930	935	880	935	1,040	2,010	1,930	1,200	995	940
14	1,050	1,050	930	935	880	935	1,040	2,090	1,930	1,200	995	940
15	1,050	1,050	930	935	880	935	1,100	2,170	1,970	1,200	968	940
16	1,080	1,050	930	935	880	935	1,160	2,260	1,850	1,200	968	940
17	1,080	1,050	930	935	880	935	1,160	2,540	1,780	1,200	968	940
18	1,080	1,050	990	880	880	935	1,220	2,360	1,780	1,200	968	940
19	1,080	1,050	990	880	880	935	1,420	2,260	1,700	1,160	968	940
20	1,080	1,050	990	880	880	935	1,290	2,100	1,700	1,160	968	940
21	1,080	1,050	990	880	880	935	1,360	1,850	1,850	1,160	968	940
22	1,080	1,050	990	880	880	935	1,360	1,850	1,930	1,160	968	912
23	1,020	1,050	990	880	880	935	1,360	1,850	1,700	1,140	968	912
24	1,020	1,050	990	880	880	990	1,360	1,850	1,620	1,140	968	940
25	1,020	1,050	990	990	880	990	1,560	1,930	1,450	1,160	968	940
26	1,020	1,080	990	1,040	800	990	1,620	2,100	1,480	1,150	968	940
27	1,020	1,050	990	1,040	800	935	1,700	2,010	1,590	1,120	968	940
28	1,020	1,050	930	1,040	800	935	1,930	1,850	1,590	1,110	940	940
29	1,020	990	930	1,040	....	935	1,930	1,780	1,590	1,100	940	940
30	1,020	990	875	1,040	....	935	2,010	1,620	1,620	1,100	940	940
31	1,020	....	875	1,040	....	935	....	1,620	....	1,090	940	......

NOTE.—Discharge Oct. 1 to Dec. 31 determined from a well-defined curve. Discharge Jan. 1 to July 24 and Aug. 12 to Sept. 30 determined from a fairly well defined curve. Indirect methods for shifting channels used July 25 to Aug. 11.

Monthly discharge of Henrys Fork at Warm River, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	1,080	990	1,050	64,600	A.
November	1,110	990	1,040	61,900	A.
December	990	875	969	59,600	A.
January	1,040	880	949	58,400	A.
February	990	800	887	49,300	A.
March	990	880	947	58,200	A.
April	2,010	935	1,250	74,400	A.
May	3,100	1,620	2,160	133,000	A.
June	2,360	1,450	1,850	110,000	A.
July	1,620	1,090	1,240	76,200	A.
August	1,080	940	994	61,100	B.
September	995	912	944	56,200	A.
The year	3,100	912	1,190	863,000	

HENRYS FORK NEAR REXBURG, IDAHO.

Location.—In sec. 30, T. 6 N., R. 39 E. Boise meridian, just below the highway bridge 7 miles due west of Rexburg. No tributaries between this station and the junction of the North and South Forks of Snake River. About 1 mile above the station the south channel of the Teton enters North Fork, and 7 miles above the main Teton or Pierre River enters. Fall River enters about 20 miles and Warm River about 35 miles above.

Records available.—April 13, 1909, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on right bank about 150 feet below the bridge. In 1912 the gage was found to be approximately 0.7 foot low, but measurements seemed to indicate that practically all of this shift occurred during the winter of 1911-12.

Channel.—Shifting gravel.

Winter flow.—Affected by ice.

Discharge measurements.—Made from a cable about one-fourth mile below gage or from the highway bridge. At high stages water overflows both banks, and at a few points the direction of the current is not exactly normal to the cable. These angles, however, are taken into account in the computations.

Diversions.—No diversions from the North Fork below the station; most of the water used above the station is taken from the tributaries.

Accuracy.—Estimates of daily discharge probably approximate for greater part of time; monthly means should be fairly reliable.

Discharge measurements of Henrys Fork near Rexburg, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*		1911.		*Feet.*	*Sec.-ft.*
Dec. 9	Lynn Crandall	3.61	*Sec.-ft.*	June 16	H. L. Stoner	8.30	6,840
			1,880	July 18	do	3.60	1,840
1911.				Aug. 9	O. W. Hartwell	2.06	818
Feb. 28[a]	Lynn Crandall	4.60		18	Lynn Crandall	2.18	924
Apr. 3	O. W. Hartwell	3.13	1,580	Sept. 12	H. L. Stoner	3.40	1,900
May 19	do	7.30	1,710	17	do	3.46	1,990
June 3	A. B. Purton	6.32	5,380				
			4,140				

[a] Ice 1½ feet thick at gage.

Daily gage height, in feet, of Henrys Fork near Rexburg, Idaho, for the year ending Sept. 30, 1911.

[T. H. Montgomery, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	3.0	3.6	3.7	4.2	6.2	4.15	2.8	4.9	5.1	7.7	1.8	2.85
2	3.0	3.65	3.7	3.7	6.0	4.1	2.8	5.0	6.1	7.4	1.8	2.8
3	3.0	3.7	3.7	3.65	5.7	4.0	3.13	5.0	6.26	7.1	1.8	3.0
4	3.1	3.7	3.8	3.5	5.1	5.1	3.0	5.0	6.7	6.7	1.85	3.1
5	3.1	3.65	3.7	4.3	5.0	5.3	3.05	5.2	7.0	6.5	1.9	3.2
6	3.1	3.65	3.65	4.2	5.25	5.35	3.0	6.0	7.6	6.7	1.9	3.4
7	3.0	3.65	3.6	4.3	4.7	5.3	2.9	7.0	7.7	6.7	1.95	3.55
8	3.2	3.7	3.5	4.7	4.4	5.2	2.85	7.4	7.6	6.8	2.0	3.6
9	3.25	3.7	3.5	4.5	4.35	5.3	2.7	7.1	7.5	7.0	2.03	3.6
10	3.25	3.8	3.7	4.4	4.2	4.75	2.65	7.4	7.5	6.3	2.0	3.6
11	3.25	3.8	3.7	4.3	4.15	4.7	2.6	7.6	7.55	5.6	2.1	3.6
12	3.25	3.8	3.6	4.3	5.0	4.6	2.55	7.0	7.4	5.7	1.9	3.5
13	3.3	3.7	3.5	4.2	5.1	4.55	2.5	6.1	7.4	5.8	2.0	3.6
14	3.3	3.7	3.5	4.2	4.95	4.2	2.4	6.15	7.8	5.0	2.0	3.65
15	3.35	3.8	3.5	4.7	4.5	4.0	2.35	6.8	8.1	4.2	2.0	3.5
16	3.4	3.75	3.5	4.65	4.5	4.2	2.35	6.7	8.3	4.0	2.0	3.4
17	3.5	3.75	3.5	4.6	4.45	4.15	2.3	7.1	8.4	3.85	2.0	3.48
18	3.55	3.75	3.5	4.6	4.4	4.1	2.4	7.5	8.2	3.6	2.18	3.35
19	3.6	3.8	3.6	4.3	4.35	3.65	2.45	7.25	8.2	3.3	2.2	3.3
20	3.5	3.85	3.6	4.4	4.4	3.55	2.6	7.0	8.1	3.1	2.25	3.3
21	3.5	3.85	4.0	4.35	4.45	3.4	3.0	6.8	8.0	2.9	2.3	3.35
22	3.45	3.8	4.2	4.6	4.35	3.55	3.4	6.0	8.3	2.7	2.4	3.4
23	3.45	3.9	6.3	4.3	4.3	3.43	3.2	5.6	8.2	2.5	2.5	3.5
24	3.45	4.0	6.4	4.0	4.2	4.2	2.8	5.5	8.2	2.45	2.6	3.5
25	3.45	4.0	6.0	4.3	4.1	3.4	2.9	5.9	8.1	2.3	2.65	3.5
26	3.4	4.0	5.7	4.7	4.0	3.4	3.2	6.2	7.9	2.2	2.65	3.5
27	3.4	3.9	5.6	5.15	4.1	3.3	3.3	6.6	7.8	2.1	2.8	3.5
28	3.4	3.95	5.2	5.1	4.6	3.2	4.0	6.5	6.6	2.0	2.9	3.4
29	3.4	3.9	5.1	5.2	....	2.9	4.5	6.0	6.7	2.0	2.9	3.3
30	3.5	3.8	5.05	5.32	....	2.8	4.8	5.4	7.2	1.9	2.9	3.2
31	3.5	....	5.0	5.6	....	2.9	....	5.1	....	1.9	2.95	....

NOTE.—Gage heights affected by ice from Dec. 19 to Mar. 20.

Daily discharge, in second-feet, of Henrys Fork near Rexburg, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1,470	1,910	1,990	....	1,490	3,050	3,120	5,860	710	1,430
2	1,470	1,950	1,990	....	1,490	3,140	4,140	5,530	710	1,410
3	1,470	1,990	1,990	....	1,720	3,120	4,310	5,200	710	1,550
4	1,540	1,990	2,070	....	1,620	3,120	4,770	4,770	735	1,630
5	1,540	1,950	1,990	....	1,660	3,320	5,090	4,560	760	1,720
6	1,540	1,950	1,950	....	1,620	4,120	5,750	4,770	760	1,870
7	1,470	1,950	1,910	....	1,540	5,180	5,860	4,770	785	1,990
8	1,610	1,990	1,830	....	1,500	5,610	5,750	4,880	810	2,040
9	1,640	1,990	1,830	....	1,390	5,280	5,640	5,090	826	2,050
10	1,640	2,070	1,990	....	1,350	5,600	5,640	4,350	810	2,060
11	1,640	2,070	1,990	....	1,320	5,800	5,700	3,620	865	2,070
12	1,640	2,070	1,910	....	1,280	5,130	5,530	3,720	760	2,000
13	1,680	1,990	1,830	....	1,240	4,180	5,530	3,820	810	2,080
14	1,680	1,990	1,830	....	1,170	4,220	5,970	3,030	810	2,120
15	1,720	2,070	1,830	....	1,140	4,380	6,300	2,320	810	2,000
16	1,750	2,030	1,830	....	1,140	4,790	6,540	2,160	810	1,920
17	1,830	2,030	1,830	....	1,100	5,210	6,650	2,040	810	1,980
18	1,870	2,030	1,830	....	1,160	5,650	6,420	1,850	909	1,890
19	1,910	2,070	....	....	1,190	5,360	6,420	1,630	930	1,850
20	1,830	2,110	....	....	1,280	5,090	6,300	1,490	958	1,850
21	1,830	2,110	....	1,920	1,550	4,880	6,190	1,350	999	1,890
22	1,790	2,070	....	2,040	1,840	4,040	6,540	1,220	1,060	1,920
23	1,790	2,150	....	1,950	1,680	3,620	6,420	1,100	1,130	2,000
24	1,790	2,230	....	2,580	1,390	3,520	6,420	1,060	1,200	2,000
25	1,790	2,230	....	1,920	1,460	3,930	6,300	975	1,240	2,000
26	1,750	2,230	....	1,920	1,660	4,240	6,080	920	1,250	2,000
27	1,750	2,150	....	1,850	1,730	4,660	5,970	865	1,350	2,000
28	1,750	2,190	....	1,780	2,270	4,560	4,660	810	1,430	1,920
29	1,755	2,150	....	1,560	2,690	4,040	4,770	810	1,440	1,850
30	1,830	2,070	....	1,490	2,950	3,420	5,310	760	1,450	1,780
31	1,830	....	....	1,560	....	3,120	....	760	1,500	....

NOTE.—Discharge Oct. 1 to Dec. 18 determined from a rating curve fairly well defined below 4,600 second-feet; mean discharge Dec. 19 to 31 estimated at 1,700 second-feet; mean monthly discharge for January estimated at 1,600 and February at 1,800 second-feet; mean discharge for Mar. 1 to 20 estimated at 1,700 second-feet; discharge Mar. 20 to Apr. 3 and Sept. 12 to 30 determined from a well-defined curve: discharge May 20 to Aug. 17 determined from the same curve after reducing gage heights 0.3 foot because of shift in channel; discharges Apr. 4 to May 19 and Aug. 18 to Sept. 11 obtained by shifting channel methods.

Monthly discharge of Henrys Fork near Rexburg, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	1,910	1,470	1,700	105,000	B.
November	2,230	1,910	2,060	123,000	B.
December	2,070	....	1,820	112,000	C.
January	....	....	1,600	98,400	C.
February	....	....	1,800	100,000	C.
March	....	....	1,760	108,000	B.
April	2,950	1,100	1,550	92,200	B.
May	5,800	3,050	4,370	269,000	B.
June	6,650	3,120	5,670	337,000	A.
July	5,860	760	2,780	171,000	A.
August	1,500	710	972	59,800	A.
September	2,120	1,410	1,900	113,000	A.
The year	6,650	....	2,330	1,690,000	

NOTE.—See footnote to table of daily discharge.

BLACKFOOT RIVER NEAR HENRY,[1] IDAHO.

Location.—In sec. 11, T. 5 S., R. 40 E. Boise meridian, about 200 feet below the wagon bridge at Rockyford crossing, about 1 mile below Blackfoot Marsh dam of the Indian Service, and about 30 miles south of Soda Springs, the most convenient railroad station. Henry post office is about 12 miles southeast of the dam. Only a small amount of seepage enters the river between the dam and the station.

Records available.—July 15, 1908, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical timber of left bank.

Channel.—Lava bowlders, gravel, and bedrock; practically permanent. Moss exists in the stream bed during certain periods.

Discharge measurements.—Made by wading or, when necessary, from a cable immediately below the gage.

Winter flow.—Affected by ice.

Diversions.—No water is diverted between the dam and the station and practically none between the dam and the Shelley station below.

Accuracy.—The daily estimates for this station are approximate at times because of the presence of ice or of moss in the channel, but sufficient measurements have been made to make the monthly estimates reliable. A rough check can be made on the estimates from the record of the gate openings at the dam.

Cooperation.—Gage-height records furnished and expense of maintenance borne by the Office of Indian Affairs.

Discharge measurements of Blackfoot River near Henry, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
June 6	A. B. Purton	1.12	31.6	Sept. 11	O. W. Hartwell	1.82	137
7	.....do	1.51	106	11	.....do	1.98	166
7	.....do	1.77	176	24	Lynn Crandall	1.74	117
7	.....do	1.00	15.6	25	.....do	0.88	4.8
July 17	E. C. La Rue	1.57	89.2	25	.....do	1.20	26.3
Sept. 10	O. W. Hartwell	1.44	57.8	25	.....do	1.53	78.1
10	.....do	1.70	88.8	26	.....do	1.84	138
10	.....do	2.06	171	26	.....do	2.10	202
11	.....do	1.40	56.6	26	.....do	2.32	290
11	.....do	1.65	104	26	.....do	2.55	368

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[1] Previously known as Blackfoot River near Rossfork.

Daily gage height, in feet, of Blackfoot River near Henry, Idaho, for the year ending Sept. 30, 1911.

[S. C. Waddell, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	1.15	1.1	....	0.96	0.96	1.00	0.98	1.12	2.00	2.32	1.78
2	....	1.15	1.1	....	.96	.96	1.00	.98	1.12	2.00	2.32	1.78
3	....	1.15	1.1	....	.96	.96	1.00	.98	1.12	2.00	2.25	1.79
4	....	1.15	1.1	1.10	.96	.96	1.00	.98	1.12	2.00	2.25	1.62
5	1.2	1.15	1.1	....	.96	.96	1.00	.98	1.12	1.80	2.25	1.40
6	1.2	1.05	1.1	....	.96	.96	1.00	.98	1.14	1.60	2.27	1.40
7	1.2	1.05	....	....	.96	.96	1.00	.98	1.14	1.60	2.28	1.40
8	1.2	1.05	....	....	.96	.96	1.00	.98	1.14	1.60	2.00	1.40
9	1.2	1.05	....	1.08	.96	.96	1.00	.98	1.14	1.60	2.00	1.40
10	1.2	1.05	1.1	....	.96	.96	.98	.98	1.15	1.60	2.10	1.44
11	1.15	1.05	....	....	.96	.96	.98	.98	1.15	1.60	2.10	1.40
12	1.15	1.05	....	....	.96	.96	.98	.98	1.15	1.60	2.10	1.36
13	1.15	1.05	....	....	.96	.96	.98	.98	1.15	1.50	2.10	1.36
14	1.15	1.05	....	....	.96	.96	.98	.98	1.15	1.50	2.08	1.39
15	1.15	1.05	....	....	.96	.96	.98	.98	1.15	1.50	2.10	1.38
16	1.15	1.05	....	1.00	.96	.96	.98	.98	1.15	1.55	2.08	1.38
17	1.15	1.05	....	....	1.00	.96	.98	.98	1.15	1.74	2.05	1.78
18	1.15	1.05	....	....	1.00	.96	.98	.98	1.15	1.89	2.03	1.76
19	1.15	1.05	....	....	1.00	.96	.98	.98	2.25	2.24	2.00	1.75
20	1.15	1.05	....	....	1.00	.96	.98	.98	2.40	2.24	2.00	1.75
21	1.15	1.05	....	....	1.00	.96	.98	.98	2.40	2.22	2.00	1.75
22	1.15	1.05	....	....	1.00	.98	.98	.98	2.20	2.25	1.98	1.76
23	1.15	1.1	....	1.10	1.00	1.00	.98	.98	2.20	2.25	1.89	1.75
24	1.15	1.1	....	....	.96	1.00	.98	.98	2.20	2.25	1.78	1.75
25	1.15	1.1	....	....	.96	.96	1.00	.98	1.80	2.25	1.77	1.54
26	1.15	1.1	....	....	.96	.96	1.00	.98	1.70	2.25	1.77	1.85
27	1.15	1.1	....	....	.96	.96	1.00	.98	2.00	2.22	1.78	1.72
28	1.15	1.1	....	.96	.96	.96	1.00	1.12	2.25	2.20	1.78	1.31
29	1.15	1.1	....	.96	....	.96	.98	1.12	2.25	2.22	1.77	1.31
30	1.15	1.1	....	.96	....	.96	.98	1.12	2.00	2.22	1.77	1.32
31	1.15	....	....	.96	....	1.00	....	1.12	....	2.22	1.78	....

NOTE.—Gage heights slightly affected by ice during latter part of November, during December, on Jan. 23, and Feb. 17 to 23. After July 4 the gage heights were affected by the growth of moss in the channel.

Daily discharge, in second-feet, of Blackfoot River near Henry, Idaho, for the year ending Sept. 30, 1911.

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	28	28	12	12	16	14	30	250	306	108
2	....	28	28	12	12	16	14	30	250	306	108
3	....	28	28	12	12	16	14	30	250	270	108
4	....	28	28	12	12	16	14	30	250	270	80
5	....	28	28	12	12	16	14	30	177	270	49
6	21	28	28	12	12	16	14	33	108	270	49
7	21	....	25	12	12	16	14	33	108	270	49
8	21	....	25	12	12	16	14	33	108	162	49
9	21	....	25	12	12	16	14	33	108	162	49
10	21	28	25	12	12	14	14	35	108	162	78
11	21	....	25	12	12	14	14	35	108	162	78
12	21	....	25	12	12	14	14	35	108	162	49
13	21	....	25	12	12	14	14	35	78	162	49
14	21	....	25	12	12	14	14	35	78	162	49
15	21	....	25	12	12	14	14	35	78	162	49
16	21	....	16	12	12	14	14	35	85	162	49
17	21	....	16	12	12	14	14	35	126	162	108
18	21	....	16	12	12	14	14	35	165	162	108
19	21	....	16	12	12	14	14	360	268	162	108
20	21	....	16	12	12	14	14	440	268	162	108
21	21	....	16	12	12	14	14	440	268	162	108
22	21	....	16	12	14	14	14	335	268	162	108
23	28	....	16	12	16	14	14	335	268	142	108
24	28	....	16	12	16	14	14	335	268	108	117
25	28	....	16	12	12	16	14	182	268	108	66
26	28	....	12	12	12	16	14	153	268	108	171
27	28	....	12	12	12	16	14	250	268	108	108
28	28	....	12	12	12	16	30	360	268	108	49
29	28	....	12	....	12	14	30	360	268	108	49
30	28	....	12	....	12	14	30	250	268	108	49
31	....	....	12	....	16	....	30	....	268	108	....

NOTE.—Discharge for periods in which channel was unobstructed determined from a well-defined rating curve. This curve was used Nov. 6 to Dec. 10, Jan. 1 to 22, Jan. 24 to Feb. 16, and Feb. 24 to July 4. Estimates of daily discharge Oct. 1 to Nov. 5 are roughly approximate and not considered of sufficient accuracy for publication. Mean discharge for October estimated at 24.9 second-feet; Nov. 1 to 5 and Dec. 6 to 9 and 11 to 31, 28 second-feet. These estimates are based on studies of climatologic records, observer's notes, and hydrograph comparison with the Shelley station. Discharge also estimated for Jan. 23 and Feb. 17 to 23. Discharge July 5 to Sept. 30, when gage heights were affected by growth of moss, obtained directly from meter measurements, and for intervening periods from a fairly well defined rating curve.

Monthly discharge of Blackfoot River near Henry, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	....	....	24.9	1,530	C.
November	28	21	24.0	1,430	C.
December	....	....	28.0	1,720	D.
January	28	12	20.2	1,240	C.
February	12	12	12.0	666	B.
March	16	12	12.5	769	B.
April	16	14	14.9	887	B.
May	30	14	16.1	990	B.
June	440	30	147	8,750	B.
July	268	78	194	11,900	B.
August	306	108	174	10,700	B.
September	171	49	80.5	4,790	B.
The year	440	....	62.3	45,400	

NOTE.—See footnote to table of daily discharge.

BLACKFOOT RIVER NEAR SHELLEY, IDAHO.

Location.—In sec. 7, T. 2 S., R. 38 E. Boise meridian, about 1½ miles above the mouth of the canyon, and about 3 miles above the N. A. Just ranch, 10 miles southeast of Shelley post office, and about 18 miles northeast of Blackfoot. Below all important tributaries; Wolverine Creek enters about 1¼ miles above.

Records available.—June 26, 1909, to September 30, 1911. Records were obtained at Presto, about 5 miles below, from April 17, 1903, to December 31, 1909. No tributaries enter between the two stations, but during the irrigation season four small canals divert about 50 second-feet of water.

Drainage area.—Not measured.

Gage.—A Friez automatic gage on the right bank, outside staff gages of which there are two, one inclined, and one vertical in a barrel stilling well. Both gages are set to same datum, which has remained unchanged since the gages were established.

Channel.—Practically permanent but somewhat rough.

Discharge measurements.—Made from cable about 10 feet below the gage house.

Winter flow.—Gage heights somewhat affected by ice.

Diversions and storage.—No diversions of any importance above the station. The entire flood flow of the river is stored behind the Indian Service dam 40 miles above.

Accuracy.—Rough cross section makes accurate low-water measurements difficult.

Cooperation.—Expense of maintenance borne by the Office of Indian Affairs.

Discharge measurements of Blackfoot River near Shelley, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Dec. 6[a]	Lynn Crandall	3.36	71	Aug. 8	O. W. Hartwell	4.15	322
				8	.....do	4.14	313
1911.				Sept. 7[a]	.....do	3.46	108
May 15[a]	O. W. Hartwell	3.72	187	22	Lynn Crandall	3.72	171

[a] Made by wading at cable section.

Daily gage height, in feet, of Blackfoot River near Shelley, Idaho, for the year ending Sept. 30, 1911.

[R. E. Reid, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	3.36	3.28		3.40	4.01	3.12	4.32	3.87	3.58	4.37		3.65
2	3.38	3.28			3.75	3.22	4.39	3.86	3.62	4.31		3.66
3	3.48	3.29			4.04	3.05	4.24	3.87	3.64	4.29		3.63
4	3.49	3.29			4.34	3.22	4.20	3.86	3.67	4.26		3.64
5	3.47	3.29			3.74	3.29	3.98	3.82	3.65	4.20		3.58
6	3.45	3.31	3.41		3.56	3.22	3.81	3.85	3.64	4.00	4.12	3.43
7	3.43	3.32	3.48	3.38	3.84	3.15	3.73	3.80	3.60	3.86	4.12	3.44
8	3.42	3.31	3.38	3.36	4.08	3.21	3.71	3.76	3.67	3.87	4.11	3.45
9	3.42	3.31	3.50	3.33		3.12	3.75	3.77	3.65	3.88	3.86	3.46
10	3.41	3.30	3.40	3.31		3.14	3.84	3.78	3.69	3.87	3.85	3.45
11	3.39	3.30	3.48	3.40	3.58	3.19	3.83	3.73	3.65	3.85	3.85	3.51
12	3.39	3.30	3.45	3.27	3.46	3.16	3.75	3.70	3.62	3.84	3.84	3.54
13	3.40	3.30	3.41	3.30	3.44	3.17	3.67	3.69	3.59	3.83	3.83	3.49
14	3.40	3.29	3.33	3.30	3.42	3.23	3.62	3.68	3.64	3.73	3.82	3.46
15	3.39	3.28	3.42	3.29	3.39	3.29	3.61	3.71	3.67	3.65	3.81	3.45
16	3.39	3.27	3.39	3.32	3.60	3.36	3.62	3.76	3.69	3.61	3.82	3.46
17	3.41	3.27	3.33	3.80	3.70	3.40	3.70	3.81	3.69	3.55	3.81	3.56
18	3.41	3.28	3.34		3.34	3.50	3.75	3.84	3.59	3.62	3.79	3.74
19	3.39	3.31	3.38		3.31	3.60	3.85	3.86	3.57	3.61	3.79	3.71
20	3.36	3.24	3.45		3.26	3.63	3.78	3.77	4.58	3.98	3.78	3.70
21	3.35	3.32	3.42	3.25	3.29	3.68	3.76	3.70	4.77	4.18	3.78	3.69
22	3.33	3.28	3.43	3.49	3.63	3.78	3.73	3.67	4.70	4.17	3.76	3.71
23	3.32	3.33	3.41		3.47	3.92	3.69	3.68	4.51	4.15	3.74	3.72
24	3.31	3.37	3.43		3.24	4.03	3.74	3.63	4.46	4.16	3.68	3.70
25	3.30	3.37	3.36		3.11	3.88	3.78	3.60	4.44	4.15	3.60	3.69
26	3.29	3.30	3.29		3.08	3.60	3.84	3.65	4.14	4.15	3.58	3.47
27	3.28		3.31		3.28	3.56	3.95	3.77	3.94	4.13	3.60	3.81
28	3.28		3.33	3.38	3.51	3.54	4.09	3.84	4.14	4.12	3.60	3.54
29	3.28			3.47		3.58	3.96	3.75	4.52	4.12	3.61	3.45
30	3.28			4.29		3.90	3.92	3.67	4.54		3.62	3.45
31	3.28		3.22	4.62		4.16		3.61			3.62	

NOTE.—Missing gage heights are due to failure of automatic gage to record properly on account of effect of ice. Gage heights affected by ice for several short periods during the winter months. See note to daily discharge table.

Daily discharge, in second-feet, of Blackfoot River near Shelley, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	83	69	82	50	265	35	398	215	130	422	308	148
2	86	69	84	50	177	35	432	212	140	393	308	151
3	107	70	86	50	277	40	360	215	146	383	308	143
4	109	70	88	50	260	60	342	212	154	370	308	146
5	105	70	90	70	174	70	254	199	148	342	308	130
6	100	74	92	70	125	60	195	208	146	261	308	96
7	96	76	107	86	120	51	171	192	135	212	308	98
8	94	74	86	83	120	58	165	180	154	215	304	100
9	94	74	111	77	120	47	177	183	148	218	212	103
10	92	72	90	74	120	50	205	186	159	215	208	100
11	88	72	107	90	130	56	202	171	148	208	208	113
12	88	72	100	68	103	52	177	162	140	205	205	121
13	90	72	92	72	98	53	154	159	133	202	202	109
14	90	70	70	72	94	62	140	157	146	171	199	103
15	88	69	70	70	88	70	138	165	154	148	195	100
16	88	68	70	76	70	83	140	180	159	138	199	103
17	92	68	60	60	70	90	162	195	159	123	195	125
18	92	69	60	60	60	111	177	205	183	140	189	174
19	88	74	60	60	60	135	208	212	128	138	189	165
20	83	63	60	60	60	143	186	183	531	254	186	162
21	81	76	60	64	50	157	180	162	636	334	186	159
22	77	69	60	60	50	186	171	154	597	329	180	165
23	76	77	60	60	40	232	159	157	494	321	174	168
24	74	85	60	80	40	273	174	143	468	325	157	162
25	72	85	60	150	40	218	186	135	459	321	135	159
26	70	72	50	200	35	135	205	148	317	321	130	105
27	69	74	50	100	35	125	243	183	239	313	135	195
28	69	76	50	86	35	121	296	205	317	308	135	121
29	69	78	50	105	....	130	247	177	500	308	138	100
30	69	80	50	383	....	225	232	154	510	308	140	100
31	69	....	50	553	....	325	....	138	....	308	140	....

NOTE.—Discharge for periods not affected by ice determined by a fairly well defined rating curve. Discharge estimated, because of ice for the following periods: Dec. 14 to 31; Jan. 1, 17, and 22; Feb. 4, 7 to 8, 16 to 28; Mar. 1 to 2. Discharges interpolated for days for which gage heights are missing.

Monthly discharge of Blackfoot River near Shelley, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	109	69	85.4	5,250	B.
November	85	63	72.9	4,340	B.
December	111	50	73.1	4,490	C.
January	553	50	103	6,330	C.
February	277	35	104	5,780	C.
March	325	35	113	6,950	B.
April	432	138	216	12,900	B.
May	215	135	179	11,000	B.
June	636	130	261	15,500	B.
July	422	123	266	16,400	B.
August	308	130	210	12,900	B.
September	195	96	131	7,800	B.
The year	636	35	151	110,000	

BIG LOST RIVER NEAR CHILLY, IDAHO.

Location.—In sec. 30, T. 8 N., R. 21 E. Boise meridian, at Howell's ranch, about 12 miles from Chilly post office and about 30 miles up the river from Mackay, the nearest railroad point.

Records available.—April 25, 1904, to August 31, 1906, and from July 1, 1907, to November 11, 1911, excepting winter months.

Drainage area.—Not measured.

Gage.—Vertical staff on left bank, directly back of Howell's shop.

Channel.—Coarse gravel; fairly permanent.

Discharge measurements.—Made from a cable about half a mile below the gage.

Winter flow.—Winter records not kept at this station, but a measurement made December 19, 1910, under conditions normal to winter gave a discharge of 67.9 second-feet for a gage height of 2.98 feet, measured to top of water in a hole cut through 1 foot of ice at the gage. Total ice cover at the gage; riffles below partly open.

Diversions.—Two small ditches divert at times between the gage and the cable, but their combined capacity is probably not over 5 second-feet. Several small ditches divert water between the station and Mackay, but practically no water is diverted above the station.

Accuracy.—Sufficient measurements have been made to afford data for reliable estimates of discharge during the periods for which gage heights were obtained.

The water that sinks in places between this station and the Mackay Dam site rises again wholly or in part above the dam site.

In this stretch are several tributaries. Thousand Springs Creek, carrying on September 10, 1911, a measured flow of 56 second-feet, and Warm Springs Creek an estimated flow of 30 second-feet on August 4, 1910, have fairly constant discharge.

Discharge measurements of Big Lost River near Chilly, Idaho, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 25	O. W. Hartwell	3.61	1,030	June 26	H. L. Stoner	5.28	1,970
June 2	do	4.12	1,490	Aug. 8	do	3.65	428
25	H. L. Stoner	5.42	2,120	8	do	3.65	401
25	do	5.25	1,930	Sept. 10	do	3.16	176

Daily gage height, in feet, of Big Lost River near Chilly, Idaho, for 1911.

[Maud Howell, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1		2.45	4.12	4.65	3.75	3.25	3.05	3.10
2		2.50	4.12	4.65	3.72	3.25	3.10	3.10
3		2.62	4.32	4.65	3.72	3.25	3.10	3.10
4		2.78	4.62	4.95	3.70	3.25	3.10	3.10
5		3.15	4.65	5.05	3.68	3.22	3.10	3.10
6		3.32	4.63	5.25	3.68	3.20	3.10	3.10
7		3.25	4.90	4.90	3.68	3.20	3.10	3.15
8		3.30	5.10	4.70	3.68	3.20	3.10	3.15
9		3.25	4.62	4.68	3.58	3.20	3.10	3.15
10		3.15	4.42	4.62	3.50	3.18	3.15	3.12
11		3.08	4.80	4.62	3.52	3.12	3.15	3.15
12		3.18	5.50	4.52	3.58	3.12	3.15	
13		3.32	5.80	4.48	3.52	3.20	3.15	
14		3.30	5.90	4.55	3.48	3.12	3.15	
15		3.65	5.90	4.58	3.48	3.12	3.12	
16		3.42	5.90	4.55	3.45	3.10	3.10	
17		3.32	5.95	4.52	3.42	3.10	3.10	
18		3.28	5.92	4.48	3.38	3.10	3.10	
19		3.18	6.25	4.42	3.38	3.10	3.10	
20		3.10	6.28	4.35	3.35	3.10	3.10	
21		3.18	6.10	4.35	3.30	3.10	3.10	
22		3.32	6.02	4.28	3.32	3.10	3.10	
23	2.10	3.52	6.08	4.15	3.30	3.10	3.10	
24	2.18	3.68	5.75	4.12	3.28	3.08	3.10	
25	2.32	3.62	5.35	4.10	3.30	3.05	3.10	
26	2.45	3.48	5.25	4.05	3.30	3.05	3.10	
27	2.52	3.42	5.25	3.98	3.30	3.05	3.10	
28	2.48	3.32	5.25	3.92	3.28	3.05	3.10	
29	2.50	3.35	5.10	3.88	3.25	3.05	3.10	
30	2.45	3.45	4.92	3.88	3.25	3.05	3.10	
31		3.75		3.82	3.25		3.10	

Daily discharge, in second-feet, of Big Lost River near Chilly, Idaho, for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	....	230	1,500	1,210	465	222	150	167
2	....	250	1,500	1,210	447	222	167	167
3	....	304	1,690	1,210	447	222	167	167
4	....	384	1,990	1,520	435	222	167	167
5	....	610	1,990	1,630	424	211	167	167
6	....	736	1,990	1,850	424	203	167	167
7	....	682	2,200	1,460	424	203	167	185
8	....	720	2,410	1,260	424	203	167	185
9	....	682	1,810	1,240	370	203	167	185
10	....	610	1,560	1,180	330	196	185	174
11	....	562	1,950	1,180	340	174	185	185
12	....	631	2,740	1,080	370	174	185	....
13	....	736	3,080	1,040	340	203	185	....
14	....	720	3,170	1,100	321	174	185	....
15	....	1,020	3,130	1,140	321	174	174	....
16	....	817	3,090	1,100	307	167	167	....
17	....	736	3,110	1,080	293	167	167	....
18	....	705	3,030	1,040	276	167	167	....
19	....	631	3,420	979	276	167	167	....
20	....	575	3,420	915	263	167	167	....
21	....	631	3,140	915	242	167	167	....
22	....	736	2,990	853	250	167	167	....
23	112	903	3,030	745	242	167	167	....
24	136	1,050	2,580	721	234	160	167	....
25	181	994	2,060	705	242	150	167	....
26	230	868	1,950	668	242	150	167	....
27	259	817	1,950	616	242	150	167	....
28	242	736	1,950	574	234	150	167	....
29	250	760	1,740	547	222	150	167	....
30	230	842	1,510	547	222	150	167	....
31	....	1,120	....	508	222	....	167	....

NOTE.—Discharge determined from well-defined rating curves. Shifting-channel methods used June 3 to 24 and 29 to 30.

Monthly discharge of Big Lost River near Chilly, Idaho, for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April 23–30	259	112	205	3,250	B.
May	1,120	230	703	43,200	B.
June	3,420	1,500	2,390	142,000	B.
July	1,850	508	1,030	63,300	A.
August	465	222	319	19,600	A.
September	222	150	180	10,700	A.
October	185	150	164	10,100	B.
November 1–11	185	167	174	3,800	B.
The period				296,000	

LITTLE LOST RIVER NEAR CLYDE, IDAHO.

Location.—In sec. 18, T. 10 N., R. 27 E. Boise meridian, at the Mulkey ranch, 1 mile upstream from Clyde post office, which is at the Basinger ranch; above the mouth of Wet Creek and below Pass Creek.

Records available.—August 28, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Gravel; shifts.

Discharge measurements.—Made from a foot log across the stream at the gage or by wading.

Diversions.—Small ranch ditches divert water both above and below the station.

Accuracy.—Owing to shifting character of the stream the daily estimates of discharge may be only approximate at times, but records on the whole are fairly reliable.

Discharge measurements of Little Lost River near Clyde, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
June 5	O. W. Hartwell	3.04	136	Aug. 9	H. L. Stoner	2.03	47.5
5	V. Waggoner	3.04	141	9	.....do	2.03	45.6
5	.....do	3.04	140	Sept. 6	.....do	1.99	46.0

Daily gage height, in feet, of Little Lost River near Clyde, Idaho for the year ending Sept. 30, 1911.

[Clarence Mulkey, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.77	1.95	1.75	1.35	1.45	1.35	1.85	1.9	2.75	2.65	2.05	2.0
2	1.8	1.95	1.7	1.35	1.45	1.4	1.95	1.95	2.75	2.65	2.05	2.0
3	1.9	1.9	1.65	1.35	1.2	1.55	1.95	1.95	2.75	2.65	2.05	1.95
4	1.9	1.9	1.5	1.35	1.45	1.55	1.9	1.95	2.95	2.65	2.0	1.95
5	1.8	1.7	1.55	1.35	1.45	1.45	2.05	1.95	3.05	2.65	2.05	1.95
6	1.9	1.7	1.65	1.3	1.5	1.3	2.05	1.95	3.1	2.65	2.05	1.95
7	1.9	1.8	1.6	1.35	1.45	1.45	2.05	2.0	2.95	2.65	2.05	1.95
8	1.8	1.8	1.65	1.35	1.45	1.35	2.05	2.05	2.95	2.35	1.9	1.95
9	1.9	1.8	1.7	1.3	1.45	1.45	2.05	2.05	3.05	2.65	2.05	1.95
10	1.9	1.8	1.6	1.15	1.45	1.35	2.05	1.95	2.9	2.35	2.05	1.9
11	1.8	1.8	1.5	1.45	1.3	1.35	2.0	2.05	2.95	1.95	2.05	1.95
12	1.9	1.8	1.55	1.45	1.25	1.45	2.15	2.05	3.05	2.35	2.05	1.95
13	1.9	1.75	1.55	1.45	1.35	1.45	2.05	2.0	3.25	2.25	2.0	1.95
14	1.9	1.7	1.45	1.3	1.35	1.45	2.2	1.95	3.25	2.25	2.05	1.95
15	1.8	1.65	1.4	1.35	1.45	1.45	2.15	1.95	3.25	2.25	2.05	1.9
16	1.9	1.57	1.4	1.25	1.3	1.5	2.15	2.0	3.25	2.25	2.05	1.95
17	1.9	1.6	1.4	1.45	1.45	2.05	2.0	1.95	3.3	2.25	2.05	1.95
18	1.9	1.75	1.4	1.15	1.45	2.1	2.15	2.05	3.5	2.25	2.05	1.95
19	1.8	1.7	1.45	1.25	1.35	2.1	2.05	2.05	3.3	2.15	2.05	1.95
20	1.9	1.65	1.3	1.15	1.4	2.15	2.05	1.95	3.15	2.15	2.0	1.95
21	1.9	1.7	1.25	1.3	1.45	2.2	2.05	2.15	3.15	2.15	2.05	1.9
22	1.8	1.65	1.25	1.25	1.45	1.95	1.95	2.55	3.05	2.15	2.05	1.8
23	1.9	1.7	1.25	1.25	1.45	1.95	1.95	2.45	2.95	2.1	2.05	1.95
24	1.9	1.8	1.25	1.2	1.3	1.85	2.0	2.85	2.95	2.1	2.05	1.95
25	1.6	1.7	1.25	1.2	1.35	2.0	2.15	2.45	2.95	2.05	2.0	1.95
26	1.9	1.6	1.25	1.3	1.45	1.95	2.0	2.45	2.85	2.05	2.05	1.95
27	1.9	1.65	1.25	1.25	1.25	1.95	2.15	2.45	2.75	2.05	2.05	1.95
28	1.8	1.7	1.2	1.25	1.45	1.95	2.15	2.65	2.75	2.05	2.05	1.9
29	1.9	1.85	1.2	1.45	....	1.8	2.15	2.65	2.75	2.05	2.05	1.95
30	1.9	1.8	1.2	1.45	....	1.85	2.15	2.65	2.65	2.05	2.05	1.95
31	1.8	....	1.2	1.45	....	2.05	....	2.65	....	2.0	2.05	....

NOTE.—Gage heights not believed to have been seriously affected by ice.

Daily discharge in second-feet, of Little Lost River near Clyde, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	34	44	34	16	20	16	38	41	107	97	50	47
2	36	44	31	16	20	18	44	44	107	97	50	47
3	41	41	28	16	12	24	44	44	107	97	50	44
4	41	41	22	16	20	24	41	44	128	97	47	44
5	36	31	24	16	20	20	50	44	138	97	50	44
6	41	31	28	15	22	15	50	44	144	97	50	44
7	41	36	26	16	20	20	50	47	128	97	50	44
8	36	36	28	16	20	16	50	50	128	71	41	44
9	41	36	31	15	20	20	50	50	138	97	50	44
10	41	36	26	11	20	16	50	44	122	71	50	41
11	36	36	22	20	15	16	47	50	128	44	50	44
12	41	36	24	20	14	20	56	50	138	71	50	44
13	41	34	24	20	16	20	50	47	162	64	47	44
14	41	31	20	15	16	20	60	44	162	64	50	44
15	36	28	18	16	20	20	56	44	162	64	50	41
16	41	25	18	14	15	22	56	47	162	64	50	44
17	41	26	18	20	20	50	47	44	168	64	50	44
18	41	34	18	11	20	53	56	50	193	64	50	44
19	36	31	20	14	16	53	50	50	168	56	50	44
20	41	28	15	11	18	56	50	44	150	56	47	44
21	41	31	14	15	20	60	50	56	150	56	50	41
22	36	28	14	14	20	44	44	88	138	56	50	36
23	41	31	14	14	20	44	44	79	128	53	50	44
24	41	36	14	12	15	38	47	117	128	53	50	44
25	36	31	14	12	16	47	56	79	128	50	47	44
26	41	26	14	15	20	44	47	79	117	50	50	44
27	41	28	14	14	14	44	56	79	107	50	50	44
28	36	31	12	14	20	44	56	97	107	50	50	41
29	41	38	12	20	....	36	56	97	107	50	50	44
30	41	36	12	20	....	38	56	97	97	50	50	44
31	36	....	12	20	....	50	....	97	....	47	50	....

NOTE.—Discharge determined from a well-defined rating curve.

Monthly discharge of Little Lost River near Clyde, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	41	34	39.2	2,410	A.
November	44	25	33.4	1,990	A.
December	34	12	20.0	1,230	B.
January	20	11	15.6	959	B.
February	22	12	18.2	1,010	B.
March	60	15	32.5	2,000	A.
April	60	38	50.2	2,990	A.
May	117	41	60.9	3,740	A.
June	193	97	135	8,030	A.
July	97	44	67.5	4,150	A.
August	50	41	49.3	3,030	A.
September	47	36	43.5	2,590	A.
The year	193	11	47.1	34,100	

BIRCH CREEK NEAR KAUFMAN, IDAHO.

Location.—In sec. 13, T. 10 N., R. 29 E. Boise meridian, at the Worthing Ranch, about 2½ miles upstream from Kaufman post office.

Records available.—September 5, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on leftbank, about 200 yards below the ranch house; datum unchanged.

Channel.—Gravel; probably permanent. Some moss exists at times.

Winter flow.—Somewhat affected by ice.

Discharge measurements.—By wading at ordinary stages; cable for use at high water.

Diversions.—The Reno ditch diverts water about 8 miles below the station.

Accuracy.—The flow, maintained mostly by springs, is very constant. Records for the greater part of the time are reliable.

Discharge measurements of Birch Creek near Kaufman, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 1	J. C. Dort	1.94	86.4
June 18	H. L. Stoner	1.90	89.4
Sept. 19	.....do	1.89	87.0

Daily gage height, in feet, of Birch Creek near Kaufman, Idaho, for the year ending Sept. 30, 1911.

[Chester Worthing, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.89	1.9	1.9	1.90	1.95	1.95	2.0	1.95	1.92	1.92	1.82	1.86
2	1.9	1.9	1.9	......	1.95	2.18	1.97	1.95	1.95	1.88	1.82	1.86
3	1.9	1.9	1.9	......	2.05	1.96	1.96	1.95	1.90	1.88	1.84	1.86
4	1.9	1.9	1.9	......	1.98	1.97	1.96	1.94	1.92	1.87	1.82	1.87
5	1.9	1.9	1.9	......	1.98	1.95	1.95	1.93	1.90	1.85	1.82	1.86
6	1.9	1.9	1.9	......	1.98	1.95	1.94	1.93	1.90	1.85	1.84	1.86
7	1.9	1.9	1.9	......	2.60	1.95	1.94	1.93	1.90	1.85	1.84	1.86
8	1.9	1.9	1.9	1.94	2.40	1.95	1.94	1.92	1.90	1.85	1.85	1.90
9	1.9	1.9	1.9	1.94	2.45	1.95	1.94	1.92	1.90	1.85	1.85	1.90
10	1.9	1.9	1.9	1.94	1.96	1.95	1.94	1.92	1.90	1.85	1.85	1.90
11	1.9	1.9	1.9	1.97	1.96	1.95	1.94	1.92	1.90	1.85	1.85	1.93
12	1.9	1.9	1.9	1.97	1.96	1.95	1.94	1.90	1.90	1.85	1.85	1.93
13	2.0	1.9	1.9	1.98	1.96	1.95	1.94	1.90	1.90	1.85	1.85	1.92
14	1.95	1.9	1.9	1.95	2.40	1.95	1.94	1.90	1.90	1.85	1.85	1.90
15	1.95	1.9	1.9	1.95	1.98	1.95	1.94	1.96	1.92	1.85	1.85	1.90
16	1.95	1.9	1.9	2.10	1.98	1.95	1.94	1.97	1.92	1.85	1.85	1.90
17	1.95	1.9	1.9	1.95	1.95	1.95	1.94	1.92	1.90	1.85	1.85	1.90
18	1.95	1.9	1.9	1.95	1.95	1.95	1.93	1.90	1.90	1.85	1.85	1.90
19	1.95	1.9	1.9	1.95	2.55	1.95	1.93	1.90	1.90	1.85	1.85	1.90
20	1.95	1.9	1.9	1.95	2.4	1.98	1.93	1.90	1.90	1.84	1.85	1.90
21	1.95	1.9	1.9	2.40	2.4	2.0	1.94	1.90	1.90	1.84	1.85	1.90
22	1.95	1.9	1.9	2.40	2.2	2.02	1.96	1.90	1.90	1.83	1.85	1.90
23	1.95	1.9	1.9	2.30	2.05	2.02	1.96	1.92	1.90	1.83	1.85	1.90
24	1.95	1.9	1.9	1.95	2.0	1.98	1.95	1.92	1.90	1.83	1.85	1.90
25	1.95	1.9	1.9	1.95	2.0	1.96	1.95	1.98	1.90	1.83	1.85	1.89
26	1.95	1.9	1.9	1.98	2.0	1.96	1.94	1.95	1.90	1.83	1.85	1.90
27	1.95	1.9	1.9	2.50	2.15	1.95	1.96	1.90	1.88	1.82	1.85	1.90
28	1.95	1.9	1.9	1.97	2.24	1.96	1.96	1.90	1.91	1.82	1.85	1.90
29	1.9	1.9	1.9	1.98	......	2.0	1.95	1.90	1.88	1.82	1.85	1.90
30	1.9	1.9	1.9	1.98	......	2.0	1.96	1.90	1.93	1.82	1.85	1.90
31	1.9	......	1.9	1.95	......	2.0	......	1.90	......	1.82	1.85	......

NOTE.—Gage heights affected by ice Jan. 12 to 23, Feb. 3 to 22, and Feb. 27 to 28.

Daily discharge, in second feet, of Birch Creek near Kaufman, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	86	88	88	99	110	99	92	92	72	80
2	88	88	88	155	103	99	99	84	72	80
3	88	88	88	101	101	99	88	84	76	80
4	88	88	88	103	101	97	92	82	72	82
5	88	88	88	99	99	95	88	78	72	80
6	88	88	88	99	97	95	88	78	76	80
7	88	88	88	99	97	95	88	78	76	80
8	88	88	88	99	97	92	88	78	78	88
9	88	88	88	99	97	92	88	78	78	88
10	88	88	88	99	97	92	88	78	78	88
11	88	88	88	99	97	92	88	78	78	95
12	88	88	88	99	97	88	88	78	78	95
13	110	88	88	99	97	88	88	78	78	92
14	99	88	88	99	97	88	88	78	78	88
15	99	88	88	99	97	101	92	78	78	88
16	99	88	88	99	97	103	92	78	78	88
17	99	88	88	99	97	92	88	78	78	88
18	99	88	88	99	95	88	88	78	78	88
19	99	88	88	99	95	88	88	78	78	88
20	99	88	88	106	95	88	88	76	78	88
21	99	88	88	110	97	88	88	76	78	88
22	99	88	88	115	101	88	88	74	78	88
23	99	88	88	115	101	92	88	74	78	88
24	99	88	88	106	99	92	88	74	78	88
25	99	88	88	101	99	106	88	74	78	86
26	99	88	88	101	97	99	88	74	78	88
27	99	88	88	99	101	88	84	72	78	88
28	99	88	88	101	101	88	90	72	78	88
29	88	88	88	110	99	88	84	72	78	88
30	88	88	88	110	101	88	95	72	78	88
31	88	....	88	110	....	88	....	72	78	....

NOTE.—Discharge Oct. 1 to Dec. 31 estimated from current-meter measurements. Mean discharges estimated for January and February at 93 and 90 second-feet. Discharge Mar. 1 to Sept. 30 determined from a well-defined rating curve.

Monthly discharge of Birch Creek near Kaufman, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	110	86	94.0	5,780	B.
November	88	88	88.0	5,240	B.
December	88	88	88.0	5,410	B.
January	....	....	93.0	5,720	C.
February	....	....	90.0	5,000	C.
March	155	99	104	6,400	B.
April	110	97	98.6	5,870	A.
May	106	88	92.8	5,710	A.
June	99	84	88.9	5,290	A.
July	92	72	77.2	4,750	A.
August	78	72	77.0	4,730	A.
September	95	80	86.7	5,160	A.
The year	155	....	89.9	65,100	

PORTNEUF RIVER NEAR PEBBLE, IDAHO.

Location.—In sec. 26, T. 7 S., R. 38 E., Boise meridian, at the ranch of W. A. Gamble, 3 miles north of Pebble post office and about 6 miles below Topons Creek.

Records available.—September 8, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff, in two sections, bolted to rock on left bank about 100 yards below the ranch house; datum unchanged.

Channel.—Gravel and small bowlders; probably permanent. Moss grows on the bottom of the stream.

Discharge measurements.—Made from a suspension footbridge and by wading.

Winter flow.—Not much affected by ice.

Diversions and storage.—A number of springs exist between the station and a storage dam of the Portneuf-Marsh Valley Irrigation Co., about 9 miles above the station. Topons Creek is to be diverted into the reservoir, which has a storage capacity of about 28,000 acre-feet. The Portneuf-Marsh Valley Irrigation Co.'s canal diverts from the river about 14 miles below the station. Small ranch ditches take out above and below the station.

Accuracy.—The relation of gage height to discharge is at times affected by the growth of moss in the channel. Sufficient measurements have been obtained to make the computations reliable.

Discharge measurements of Portneuf River near Pebble, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 21	O. W. Hartwell	4.28	326	July 15	H. L. Stoner	2.55	56.1
Apr. 18	J. C. Dort	3.04	130	Aug. 16	.....do	2.15	42.4
May 12	O. W. Hartwell	3.79	190	30	G. C. Baldwin	2.08	37.8
June 20	H. L. Stoner	3.36	98.6				

Daily gage height, in feet, of Portneuf River near Pebble, Idaho, for the year ending Sept. 30, 1911.

[W. A. Gamble, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.2	2.2	2.3	2.2	5.9	2.3	3.40	3.60	3.65	3.15	2.30	2.10
2	2.2	2.2	2.3	2.2	5.2	2.3	3.65	3.60	3.60	3.20	2.30	2.10
3	2.2	2.2	2.3	2.2	4.45	2.3	3.80	3.60	3.60	3.15	2.30	2.10
4	2.2	2.2	2.3	2.2	3.65	2.3	3.80	3.60	3.60	3.05	2.30	2.10
5	2.2	2.2	2.3	2.2	3.0	2.3	3.75	3.60	3.60	3.00	2.25	2.10
6	2.2	2.2	2.3	2.2	2.9	2.55	3.65	3.60	3.55	2.90	2.20	2.10
7	2.2	2.2	2.3	2.2	2.5	3.2	3.45	3.60	3.50	2.85	2.20	2.10
8	2.2	2.2	2.2	2.2	2.5	3.45	3.30	3.65	3.50	2.80	2.20	2.20
9	2.2	2.2	2.2	2.2	2.4	3.0	3.20	3.80	3.50	2.75	2.20	2.20
10	2.2	2.2	2.2	2.3	2.3	3.2	3.20	3.85	3.50	2.70	2.20	2.20
11	2.2	2.2	2.2	2.3	2.35	3.6	3.20	3.85	3.50	2.60	2.20	2.20
12	2.2	2.2	2.3	2.2	2.4	3.5	3.20	3.80	3.50	2.60	2.20	2.20
13	2.2	2.2	2.4	2.2	2.3	3.45	3.20	3.75	3.50	2.60	2.20	2.20
14	2.2	2.2	2.3	2.2	2.3	3.3	3.15	3.70	3.40	2.60	2.10	2.20
15	2.2	2.2	2.1	2.2	2.3	3.4	3.10	3.75	3.40	2.50	2.10	2.20
16	2.2	2.2	2.2	2.3	2.3	3.6	3.00	3.90	3.40	2.50	2.10	2.20
17	2.2	2.2	2.3	2.3	2.3	3.7	3.00	3.95	3.40	2.50	2.10	2.20
18	2.2	2.2	2.3	2.3	2.3	3.8	3.00	4.10	3.40	2.50	2.10	2.20
19	2.2	2.2	2.3	2.2	2.3	3.9	3.00	4.10	3.40	2.40	2.10	2.20
20	2.2	2.2	2.3	2.2	2.3	4.0	3.05	4.10	3.40	2.40	2.10	2.20
21	2.2	2.3	2.3	2.2	2.3	4.2	3.20	3.95	3.50	2.40	2.10	2.20
22	2.2	2.3	2.3	2.2	2.3	4.3	3.30	3.80	3.50	2.40	2.10	2.20
23	2.2	2.4	2.3	2.2	2.3	4.4	3.30	3.70	3.40	2.40	2.10	2.30
24	2.2	2.4	2.3	2.35	2.3	4.4	3.20	3.70	3.25	2.40	2.10	2.30
25	2.2	2.4	2.3	3.8	2.3	4.35	3.20	3.70	3.20	2.30	2.10	2.20
26	2.2	2.4	2.2	4.25	2.3	4.2	3.20	3.70	3.10	2.30	2.10	2.20
27	2.2	2.35	2.2	3.75	2.3	3.95	3.30	3.85	3.05	2.30	2.00	2.20
28	2.2	2.3	2.2	3.1	2.3	3.6	3.45	3.90	3.00	2.30	2.00	2.20
29	2.2	2.3	2.2	2.5	....	3.4	3.55	4.00	3.00	2.30	2.00	2.20
30	2.2	2.3	2.2	3.75	....	3.3	3.60	3.90	3.10	2.30	2.10	2.20
31	2.2	....	2.2	6.0	....	3.3	....	3.85	....	2.30	2.10	....

NOTE.—Gage heights probably not affected by ice.

Daily discharge, in second-feet, of Portneuf River near Pebble, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	47	47	56	47	606	56	189	181	152	93	53	39
2	47	47	56	47	481	56	226	179	145	102	54	39
3	47	47	56	47	354	56	249	178	144	97	55	39
4	47	47	56	47	226	56	249	176	143	98	56	39
5	47	47	56	47	135	56	242	175	142	83	52	39
6	47	47	56	47	122	82	226	173	135	77	47	39
7	47	47	56	47	76	161	193	172	128	73	47	39
8	47	47	47	47	76	196	172	178	127	68	47	47
9	47	47	47	47	66	135	155	198	126	65	47	47
10	47	47	47	56	56	161	154	204	124	63	47	47
11	47	47	47	56	61	219	153	203	123	54	47	47
12	47	47	56	47	66	204	152	193	121	56	47	47
13	47	47	66	47	56	196	151	185	120	58	47	47
14	47	47	56	47	56	175	143	177	108	60	39	47
15	47	47	39	47	56	189	135	184	107	53	39	47
16	47	47	47	56	56	219	122	204	106	53	39	47
17	47	47	56	56	56	234	120	212	105	54	39	47
18	47	47	56	56	56	249	118	233	104	55	39	47
19	47	47	56	47	56	265	117	232	103	47	39	47
20	47	47	56	47	56	281	123	230	103	48	39	47
21	47	56	56	47	56	313	140	206	117	50	39	47
22	47	56	56	47	56	329	152	183	118	51	39	47
23	47	66	56	47	56	345	151	168	108	52	39	56
24	47	66	56	61	56	345	135	167	92	53	39	56
25	47	66	56	249	56	337	134	166	88	45	39	47
26	47	66	47	321	56	313	133	165	80	46	39	47
27	47	61	47	242	56	273	145	185	77	48	32	47
28	47	56	47	148	56	219	163	192	73	49	32	47
29	47	56	47	76	....	189	176	205	75	50	32	47
30	47	56	47	242	....	175	182	190	87	51	39	47
31	47	....	47	624	....	175	....	192	....	52	39	....

NOTE.—Discharges, except as noted below, were obtained from a well-defined rating curve. Shifting channel methods were used Apr. 7 to Aug. 4 on account of the growth of moss in the channel.

Monthly discharge of Portneuf River near Pebble, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	47	47	47.0	2,890	A.
November	66	47	51.5	3,060	A.
December	66	39	52.6	3,230	A.
January	624	47	99.6	6,120	B.
February	606	56	115	6,390	B.
March	345	56	202	12,400	A.
April	249	117	163	9,700	B.
May	233	165	190	11,700	B.
June	152	73	113	6,720	B.
July	102	45	61.1	3,760	B.
August	56	32	42.8	2,630	A.
September	56	39	45.7	2,720	A.
The year	624	32	98.6	71,300	

RAFT RIVER NEAR BRIDGE, IDAHO.

Location.—In sec. 7, T. 15 S., R. 27 E. Boise meridian, about one-fourth mile above the Olson ranch and 2 miles above Bridge post office.

Records available.—September 18, 1909, to September 30, 1911.

Gages.—From September 18, 1909, to February 28, 1910, a vertical staff gage located at the bridge near Hawkins's ranch house was used. This gage was washed out on February 28, 1910, and on March 15, 1910, a new gage was installed with datum 3.42 feet lower. A supplementary gage was also installed in a high-water channel which carried water in 1910 and for some time after the flood. The discharge records published for 1910 include the flow in both channels. On January 30, 1911, the gage was washed out again, the bridge also being carried away. On February 24, 1911, a sloping gage was installed on the right bank farther down the stream, at the Olson ranch. The datum of this gage is unrelated to that of the old gage at Hawkins's ranch. A supplementary gage is also installed in a high-water channel which carries water at flood times unless dammed off. The datum of this gage has remained the same.

Channel.—Present channel is of gravel and shifts at times. The high-water channel is dammed off during the irrigating season, but the dam is likely to go out during flood periods.

Discharge measurements.—At ordinary stages made by wading; high-water measurements must be made from bridges across various sloughs, etc.

Winter flow.—Somewhat affected by ice.

Diversions.—Most of the small ranch ditches that divert water above the station are flood-water rights.

Accuracy.—Present station is well rated, and the published records are fairly reliable, especially those derived from observations at the present gage.

Discharge measurements of Raft River near Bridge, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 9	Lynn Crandall	4.75	7.8	Feb. 22	Lynn Crandall	3.8	16.8
20	O. W. Hartwell	4.78	10.3	May 17	J. C. Dort	3.5	18.0
Dec. 2	Lynn Crandall	4.83	15.8	June 10	O. W. Hartwell	3.24	13.3
				Sept. 19	Lynn Crandall	3.05	4.8

NOTE.—Gage heights of 1911 measurements refer to the gage established Feb. 24, 1911, at Olson's ranch.

Daily gage height, in feet, of Raft River near Bridge, Idaho, for the year ending Sept. 30 1911.

[Andrew Olson, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	4.9	4.8	4.8	5.7		4.2	4.0	3.6	3.3	4.3	3.0	2.9
2	4.9	4.8	4.8	6.0		4.2	4.0	3.6	3.3	3.9	3.0	2.8
3	4.9	4.8	4.8	6.05		4.0	3.9	3.6	3.3	3.7	2.9	2.9
4	4.9	4.8	4.85	5.8		4.2	3.9	3.5	3.3	3.4	3.0	2.9
5	4.85	4.8	4.85	5.7		4.3	3.9	3.5	3.4	3.4	3.0	2.8
6	4.85	4.8	4.85	5.7		4.3	3.8	3.5	3.4	3.4	2.9	3.0
7	4.8	4.8	4.85	5.7		4.1	3.8	3.5	3.4	3.4	3.0	3.0
8	4.8	4.8	4.9	5.7		4.2	3.7	3.5	3.4	3.4	3.0	2.9
9	4.8	4.8	4.9	5.7		4.5	3.7	3.5	3.3	3.3	2.9	3.0
10	4.8	4.8	4.9	5.7		4.0	3.7	3.5	3.3	3.2	3.0	3.0
11	4.8	4.85	4.9	5.7		4.0	3.7	3.4	3.3	3.2	3.0	2.9
12	4.8	4.85	4.95	5.8		4.3	3.7	3.4	3.2	3.1	2.9	3.0
13	4.75	4.85	5.0	5.85		3.8	3.7	3.5	3.2	3.0	3.0	3.45
14	4.75	4.85	5.05	5.9		3.9	3.7	3.4	3.1	3.1	3.0	3.7
15	4.75	4.85	5.2	5.9		4.0	3.7	3.5	3.3	3.1	2.8	3.2
16	4.75	4.85	5.3	5.75		4.0	3.7	3.5	3.3	3.0	2.9	3.1
17	4.75	4.85	5.5	5.2		4.2	3.7	3.5	3.3	3.1	2.9	3.0
18	4.75	4.85	5.5	5.45		4.2	3.6	3.6	3.4	3.1	2.8	3.1
19	4.75	4.85	5.5	5.5		4.1	3.6	3.6	3.4	3.0	2.9	3.05
20	4.75	4.85	5.5	5.5		4.0	3.6	3.6	3.4	3.1	2.9	3.1
21	4.75	4.85	5.5	5.4		4.0	3.6	3.6	4.0	3.1	2.8	3.1
22	4.75	4.85	5.55	5.4		4.0	3.6	3.6	3.7	3.0	2.9	3.1
23	4.75	4.85	5.55	4.95		3.9	3.6	3.6	3.5	3.1	2.9	3.2
24	4.75	4.85	5.6	4.95	3.8	4.0	3.6	3.6	3.4	3.0	2.8	3.2
25	4.75	4.85	5.6	5.5	3.8	4.0	3.6	3.5	3.4	2.9	2.9	3.1
26	4.75	4.85	5.7	7.75	3.9	3.9	3.5	3.4	3.3	3.0	3.0	3.1
27	4.75	4.85	5.7	7.0	4.0	3.8	3.5	3.4	3.3	3.0	2.9	3.1
28	4.8	4.8	5.7	7.0	4.3	3.8	3.6	3.4	3.2	2.9	3.0	3.1
29	4.8	4.8	5.65	8.0		3.8	3.6	3.4	3.3	3.0	2.9	3.1
30	4.8	4.8	5.65	10.5		3.7	3.6	3.4	3.4	3.0	2.8	3.1
31	4.8		5.6			3.8		3.3		2.9	2.9	

NOTE.—Gage heights Dec. 13 to Jan. 25, Feb. 24 to Mar. 4 affected by ice. Gage heights Oct. 1 to Jan. 30 refer to gage installed Mar. 15, 1910. Gage heights Feb. 24 to Sept. 30 refer to the gage installed Feb. 22, 1911. Jan. 26 to Feb. 11 was a period of high water, the gage being destroyed on Jan. 30.

Daily gage height, in feet, of flood channel of Raft River near Bridge, Idaho, for Feb. 24, to Apr. 10, 1911.

[Andrew Olson, observer.]

Day.	Feb.	Mar.	Apr.	Day.	Feb.	Mar.	Apr.	Day.	Feb.	Mar.	Apr.
1	......	1.0	1.5	11	......	1.9	......	21	......	1.5	......
2	......	1.0	1.5	12	......	3.6	......	22	......	1.5	......
3	......	1.7	1.4	13	......	2.0	......	23	......	1.6	......
4	......	1.7	1.4	14	......	1.5	......	24	1.2	1.6	......
5	......	4.2	1.4	15	......	1.5	......	25	1.2	1.6	......
6	......	2.8	1.3	16	......	1.6	......	26	1.3	1.7	......
7	......	3.3	1.2	17	......	1.6	......	27	1.0	1.7	......
8	......	3.4	1.0	18	......	1.6	......	28	1.0	1.4	......
9	......	4.5	1.0	19	......	1.5	......	29	......	1.2	......
10	......	1.9	.7	20	......	1.5	......	30	......	1.2	......
								31	......	1.2	......

NOTE.—Gage installed Feb. 24. Channel dry after Apr. 10.

Daily discharge, in second-feet, of Raft River near Bridge, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	20	12	12	20	46	22	14	73	4	2.5
2	20	12	12	20	46	22	14	41	4	1.5
3	20	12	12	30	39	22	14	29	2.5	2.5
4	20	12	16	40	39	18	14	15	4	2.5
5	16	12	16	70	39	18	18	14	4	1.5
6	16	12	16	70	33	18	18	14	2.5	4
7	12	12	16	53	33	18	19	14	4	4
8	12	12	20	61	27	18	19	14	4	2.5
9	12	12	20	89	27	18	15	11	2.5	4
10	12	12	20	46	27	18	15	8	4	4
11	12	16	20	46	27	14	15	8	4	2.5
12	12	16	20	70	27	14	12	6	2.5	4
13	8.5	16	....	33	27	18	12	4	4	16
14	8.5	16	....	39	27	14	9	6	4	27
15	8.5	16	....	46	27	18	15	6	1.5	8
16	8.5	16	....	46	27	18	15	4	2.5	6
17	8.5	16	....	61	27	18	15	6	2.5	4
18	8.5	16	....	61	22	24	19	6	1.5	6
19	8.5	16	....	53	22	25	19	4	2.5	5
20	8.5	16	....	46	22	24	19	6	2.5	6
21	8.5	16	....	46	22	25	53	6	1.5	6
22	8.5	16	....	46	22	24	33	4	2.5	6
23	8.5	16	....	39	22	25	22	6	2.5	8
24	8.5	16	....	46	22	24	18	4	1.5	8
25	8.5	16	....	46	22	20	18	2.5	2.5	6
26	8.5	16	....	39	18	16	14	4	4	6
27	8.5	16	....	33	18	16	14	4	2.5	6
28	12	12	....	33	22	18	11	2.5	4	6
29	12	12	....	33	22	18	14	4	2.5	6
30	12	12	....	27	22	18	18	4	1.5	6
31	12	....	....	33	....	14	....	2.5	2.5	....

NOTE.—Discharge determined as follows: Oct. 1 to Dec. 12 from a well-defined rating curve; Mar. 5 to May 17 and July 5 to Sept. 30 from a well-defined rating curve; June 10 to 20 from a fairly well-defined rating curve; May 18 to June 9 and June 21 to July 4 shifting channel methods were used; mean discharge Dec. 13 to 31, Jan. 1 to 25, and Feb. 24 to 28, estimated at 20 second-feet; Mar. 1 to 4 estimated as given. Data insufficient to make reliable estimates for the high-water period of Jan. 26 to Feb. 11. The above estimates do not include flow in the flood channel. A gage record was obtained for flood channel from Feb. 24 to Apr. 10 when the channel was dry. No measurements were made of the flood channel, but the discharge for Feb. 24 to Apr. 10 has been estimated roughly at 350 acre-feet.

Monthly discharge of Raft River near Bridge, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	20	8.5	11.6	713	B.
November	16	12	14.3	851	B.
December	....	12	18.7	1,150	C.
January 1-25	....	....	20	992	D.
February 24-28	....	....	20	198	D.
March	89	20	45.8	2,820	B.
April	46	18	27.4	1,630	A.
May	25	14	19.3	1,190	B.
June	53	9	17.5	1,040	B.
July	73	2.5	10.7	658	B.
August	4	1.5	2.92	180	B.
September	27	1.5	6.15	366	B.

NOTE.—See footnote to daily discharge table.

CLEAR CREEK NEAR NAF, IDAHO.

Location.—In sec. 1, T. 14 N., R. 13 W., Salt Lake base and meridian, at the Kempton ranch, about 2 miles south of the Idaho-Utah State line, and about 4 miles south of Naf post office.

Records available.—January 20, 1910, to June 30, 1911, when station was discontinued.

Drainage area.—Not measured.

Gage.—Vertical staff on right bank at the fence line and about 80 feet above point at which the road crosses creek; datum unchanged so far as known.

Channel.—Rocky and rough.

Discharge measurements.—Made by wading.

Winter flow.—Affected by ice.

Diversions and storage.—Two small ranch ditches divert above the station. It is proposed to divert any unappropriated water into a contemplated reservoir on Raft River.

Accuracy.—Records are rather fragmentary and approximate.

Discharge measurements of Clear Creek near Naf, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 9	Lynn Crandall	0.5	1.9	May 18	J. C. Dort	0.96	17.6
20	Hartwell and Searle	.52	2.3	June 10	O. W. Hartwell	1.28	79.2
Dec. 3	Lynn Crandall	.53	1.8				

Daily gage height, in feet, of Clear Creek near Naf, Idaho, for the year ending Sept. 30, 1911.

[Louis Desportes, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.
1	0.6	0.6	0.6	0.5	0.8	0.6	0.7	0.7	1.3
2	.5	.6	.6	.5	.7	.6	.75	.75	1.3
3	.5	.6	.6	.6	.95	.6	.7	.7	1.25
4	.6	.65	.6	.6	.75	.75	.6	.8	1.4
5	.6	.7	.6	.5	.6	.6	.65	.9	1.4
6	.5	.6	.6	.6	.65	.6	.6	.9	1.35
7	.5	.6	.5	.5	.8	.55	.7	.9	1.35
8	.6	.6	.5	.6	1.05	.6	.6	.9	1.4
9	.5	.6	.7	.6	.85	.6	.7	1.0	1.3
10	.5	.6	.6	.6	.6	.7	.7	.9	1.3
11	.55	.6	.6	.6	.6	.8	.7	.9	1.3
12	.6	.7	.6	.55	.6	.6	.7	.9	1.4
13	.6	.6	.6	.5	.6	.6	.6	.9	1.3
14	.6	.6	.5	.6	.6	.5	.7	.95	1.3
15	.6	.6	.8	.6	.6	.6	.65	1.1	1.3
16	.6	.5	.8	.65	.6	.65	.7	1.1	1.4
17	.6	.5	.6	.6	.7	.6	.7	1.0	1.35
18	.6	.6	.7	.6	.6	.6	.7	.95	1.4
19	.6	.6	.6	.6	.6	.7	.7	.9	1.3
20	.6	.5	.6	.6	.6	.65	.62	.9	1.3
21	.6	.6	.6	.55	.6	.7	.6	.95	1.3
22	.6	.6	.5	1.3	.6	.7	.6	.98	1.2
23	.6	.6	.5	.7	.55	.7	.7	1.05	1.2
24	.6	.6	.5	.8	.6	.7	.72	1.2	1.2
25	.6	.6	.8	1.4	.6	.65	.75	1.1	1.1
26	.6	.6	.8	.9	.6	.8	.78	1.2	1.1
27	.6	.6	.7	.7	.55	.7	.8	1.18	1.05
28	.6	.7	.6	.7	.6	.7	.8	1.1	1.1
29	.7	.6	.6	.6	....	.7	.8	1.1	1.0
30	.7	.6	.6	1.4	....	.7	.7	1.2	1.0
31	.7	....	....	1.5	....	.7	....	1.3	....

NOTE.—Gage heights affected by ice Dec. 15 to 31, during January and probably also during February.

Daily discharge, in second-feet, of Clear Creek near Naf, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Mar.	Apr.	May.	June.
1	3.5	3.5	3.5	3.5	6	6	85
2	1.8	3.5	3.5	3.5	7.5	7.5	85
3	1.8	3.5	3.5	3.5	6	6	71
4	3.5	4.8	3.5	7.5	3.5	9	115
5	3.5	6	3.5	3.5	4.8	14	115
6	1.8	3.5	3.5	3.5	3.5	14	100
7	1.8	3.5	1.8	2.6	6	14	100
8	3.5	3.5	1.8	3.5	3.5	14	115
9	1.8	3.5	6	3.5	6	21	85
10	1.8	3.5	3.5	6	6	14	85
11	2.6	3.5	3.5	9	6	14	85
12	3.5	6	3.5	3.5	6	14	115
13	3.5	3.5	3.5	3.5	3.5	14	85
14	3.5	3.5	1.8	1.8	6	18	85
15	3.5	3.5	....	3.5	4.8	36	85
16	3.5	1.8	....	4.8	6	36	115
17	3.5	1.8	....	3.5	6	21	100
18	3.5	3.5	....	3.5	6	18	115
19	3.5	3.5	....	6	6	14	85
20	3.5	1.8	....	4.8	4.0	14	85
21	3.5	3.5	....	6	3.5	18	85
22	3.5	3.5	....	6	3.5	20	57
23	3.5	3.5	....	6	6	28	57
24	3.5	3.5	....	6	6.6	57	57
25	3.5	3.5	....	4.8	7.5	36	36
26	3.5	3.5	....	9	8.4	57	36
27	3.5	3.5	....	6	9	53	28
28	3.5	6	....	6	9	36	36
29	6	3.5	....	6	9	36	21
30	6	3.5	....	6	6	57	21
31	6	....	....	6	....	85	....

NOTE.—Discharge for open-water periods determined from a rating curve well defined above 15 second-feet and fairly well defined below. Discharge estimated because of ice effect, as follows: Dec. 15 to 31, 1.5 second-feet; January, 12 second-feet; February, 4.0 second-feet.

Monthly discharge of Clear Creek near Naf, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	6	1.8	3.38	208	B.
November	6	1.8	3.62	215	B.
December	6		2.32	143	D.
January			12.0	738	
February			4.0	222	
March	9	1.8	4.91	302	B.
April	9	3.5	5.85	348	B.
May	85	6	25.9	1,590	A.
June	115	21	78.2	4,650	A.
The period				8,420	

Note.—Monthly means for January and February are very approximate.

CASSIA CREEK NEAR CONANT, IDAHO.

Location.—In sec. 19, T. 13 S., R. 26 E. Boise meridian, about 200 yards below the point at which the road crosses the creek at the ranch of Mrs. E. F. Conant, and about 1 mile above Conant post office; below all tributaries.

Records available.—September 18, 1909, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on left bank about 10 feet above the suspension footbridge. Gage has raised at various times, but gage heights as published have been reduced as nearly as possible to original gage datum.

Channel.—Gravel; shifts.

Discharge measurements.—Made from a suspension footbridge and wading.

Winter flow.—Ice forms at the gage in winter.

Diversions.—Ranch ditches divert both above and below the station.

Accuracy.—Records are approximate for part of the time, as the conditions of the gage and channel were unstable and gage readings were unreliable.

Discharge measurements of Cassia Creek near Conant, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 9	Lynn Crandall	1.97	5.5	Feb. 21	Lynn Crandall	2.35	26.8
19	Hartwell and Searle	2.04	7.9	May 17	J. C. Dort	2.72	40.2
Dec. 2	Lynn Crandall	2.21	11.2	June 10	O. W. Hartwell	2.81	47.8
4	do	2.39	18.1	Sept. 19	Lynn Crandall	2.01	2.3

Daily gage height, in feet, of Cassia Creek near Conant, Idaho, for the year ending Sept. 30, 1911.

[Robert Southworth, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.85	1.9	2.2	1.95	3.05	2.45	2.8	2.45	2.85	......	2.1	1.55
2	1.9	1.95	2.3	2.0	3.05	2.75	2.8	2.45	2.9	2.95	2.1	1.55
3	1.9	1.9	2.25	1.95	2.85	2.95	2.75	2.25	2.95	2.95	2.0	1.55
4	1.95	1.95	2.3	2.0	2.75	2.95	2.75	2.25	2.95	2.9	1.95	1.55
5	1.9	1.9	2.25	1.95	2.25	2.95	2.75	2.25	2.95	2.9	1.95	1.55
6	1.95	1.95	2.25	1.95	2.15	2.95	2.75	2.25	2.95	2.9	1.95	1.55
7	2.0	2.0	2.3	2.0	2.05	2.9	2.75	2.45	2.95	2.9	1.85	1.55
8	1.95	1.95	2.25	2.05	2.05	2.9	2.7	2.45	2.9	2.9	1.85	1.55
9	2.0	2.0	2.3	2.1	2.05	2.85	2.65	2.45	2.9	2.9	1.75	1.55
10	1.95	1.95	2.25	2.05	2.05	2.85	2.65	2.55	2.9	2.85	1.65	1.55
11	1.95	1.95	2.15	2.05	2.05	2.85	2.65	2.55	2.9	2.85	1.65	1.55
12	2.0	2.0	2.2	2.1	2.0	2.75	2.6	2.55	2.95	2.75	1.65	1.55
13	2.0	1.95	2.15	2.05	2.0	2.75	2.6	2.55	3.0	2.75	1.65	1.55
14	2.05	2.0	2.2	2.1	2.0	2.75	2.55	2.55	3.05	2.75	1.6	1.55
15	2.0	1.95	2.15	2.15	2.0	2.75	2.55	2.65	3.15	2.75	1.6	1.55
16	2.0	1.95	2.15	2.15	1.95	2.75	2.55	2.85	3.15	2.65	1.6	1.55
17	......	2.0	2.2	2.1	1.95	2.75	2.55	2.85	3.15	2.65	1.55	1.6
18	......	1.95	2.1	2.05	1.95	2.75	2.5	2.75	3.15	2.55	1.55	1.6
19	2.0	2.0	2.15	2.1	1.95	2.85	2.5	2.75	3.1	2.55	1.55	1.55
20	1.95	2.0	2.05	2.05	2.15	2.85	2.5	2.65	3.1	2.45	1.55	1.55
21	1.95	2.0	2.05	2.05	2.35	2.85	2.45	2.65	3.05	2.45	1.55	1.55
22	2.0	2.2	2.1	2.1	2.15	2.85	2.45	2.65	3.0	2.25	1.55	1.55
23	1.95	2.15	2.05	2.15	2.15	2.85	2.35	2.65	3.0	2.25	1.55	1.55
24	2.0	2.2	2.1	2.2	2.25	2.85	2.35	2.75	2.95	2.25	1.55	1.55
25	1.95	2.15	2.0	2.15	2.15	2.85	2.35	2.75	2.95	2.25	1.55	1.55
26	1.95	2.15	2.0	2.15	2.2	2.8	2.55	2.75	2.95	2.25	1.55	1.55
27	2.0	2.2	2.05	2.75	2.2	2.8	2.55	2.75	3.0	2.15	1.55	1.55
28	1.95	2.15	2.0	2.85	2.25	2.75	2.55	2.75	3.05	2.15	1.55	1.55
29	2.0	2.2	2.05	2.9	......	2.75	2.55	2.75	3.05	2.15	1.55	1.55
30	1.95	2.15	2.0	3.05	......	2.75	2.55	2.75	3.05	2.15	1.55	1.6
31	1.95	......	2.0	3.05	......	2.75	......	2.8	......	2.15	1.55	......

NOTE.—Gage heights probably not seriously affected by ice. Records for August and September do not represent the flow as it was artificially controlled during parts of each day.

Daily discharge, in second-feet, of Cassia Creek near Conant, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1	3.0	3.9	11	4.2	91	34	70	22	53	70	4.0
2	3.9	5.2	14	5.2	94	64	70	22	58	63	4.0
3	3.9	3.9	12	4.2	70	90	64	12	64	62	2.2
4	5.2	5.2	14	5.2	60	90	64	12	64	56	1.6
5	3.9	3.9	12	4.2	21	90	64	12	64	56	1.6
6	5.2	5.2	12	4.2	16	90	64	12	64	55	1.6
7	6.4	6.4	14	5.2	12	83	64	22	64	54	....
8	5.2	5.2	12	6.4	12	83	57	22	58	53	....
9	6.4	6.4	14	7.6	12	76	52	22	58	53	....
10	5.2	5.2	12	6.4	12	76	52	28	58	47	....
11	5.2	5.2	9.1	6.4	12	76	52	28	58	47	....
12	6.4	6.4	11	7.6	10	64	47	28	64	37	....
13	6.4	5.2	9.1	6.4	10	64	47	28	70	37	....
14	8.0	6.4	11	7.6	10	64	42	28	76	36	....
15	6.4	5.2	9.1	9.1	10	64	42	34	89	36	....
16	6.4	5.2	9.1	9.1	9.0	64	42	53	89	28	....
17	6.4	6.4	11	7.6	9.0	64	42	53	89	28	....
18	6.4	5.2	7.6	6.4	9.0	64	38	43	89	22	....
19	6.4	6.4	9.1	7.6	9.0	76	38	43	82	22	....
20	5.2	6.4	6.4	6.4	16	76	38	34	82	16	....
21	5.2	6.4	6.4	6.4	27	76	22	34	76	16	....
22	6.4	13	7.6	7.6	16	76	22	34	70	8.2	....
23	5.2	11	6.4	9.1	16	76	17	34	70	8.2	....
24	6.4	13	7.6	11	21	76	17	43	64	8.2	....
25	5.2	11	5.2	9.1	16	76	17	43	64	8.2	....
26	5.2	9.1	5.2	9.1	18	70	28	43	64	8.2	....
27	6.4	11	6.4	44	18	70	28	43	70	5.2	....
28	5.2	9.1	5.2	56	21	64	28	43	76	5.2	....
29	6.4	11	6.4	64	....	64	28	43	76	5.2	....
30	5.2	9.1	5.2	86	....	64	28	43	76	5.2	....
31	5.2	....	5.2	89	....	64	....	48	....	5.2	....

NOTE.—Discharge determined as follows: From fairly well defined curves, Oct. 1 to Nov. 25; Nov. 26 to Jan. 26; Apr. 21 to June 30; Feb. 5 to Apr. 20; and July 16 to Aug. 6; by indirect method for shifting channel, Jan. 27 to Feb. 4, and July 1 to 15. Mean discharge Aug. 7 to Sept. 10, estimated at 1.0 second-foot, and Sept. 11 to 30 at 2.0 second-feet.

Monthly discharge of Cassia Creek near Conant, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	8.0	3.0	5.60	344	B.
November	13	3.9	7.07	421	C.
December	14	5.2	9.24	568	C.
January	89	4.2	16.7	1,030	C.
February	94	9.0	23.5	1,310	B.
March	90	34	71.9	4,420	B.
April	70	17	42.8	2,550	C.
May	53	12	32.5	2,000	B.
June	89	53	70.0	4,170	B.
July	70	5.2	31.0	1,910	C.
August	4.0		1.29	79.3	D.
September			1.67	99.4	D.
The year	94		26.1	18,900	

GOOSE CREEK ABOVE TRAPPER CREEK, NEAR OAKLEY, IDAHO.

Location.—In sec. 13, T. 15 S., R. 21 E., Boise meridian, about 200 feet above the upper dam site on Goose Creek, 5 miles above the junction with Trapper Creek and about 10 miles south of Oakley post office.

Records available.—April 29, 1911, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Friez automatic gage with outside vertical staff.

Channel.—Fairly permanent.

Discharge measurements.—Made from a cable or, when stage permits, by wading.

Winter flow.—Relation between gage height and discharge affected by ice in the winter.

Accuracy.—Records for most of the time are reliable.

Cooperation.—Gage heights and several measurements are furnished by the Twin Falls Oakley Land & Water Co.

Discharge measurements of Goose Creek above Trapper Creek, near Oakley, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 11	McClelland and Switzer.	3.55	213	June 10	R. A. Switzer	2.13	46.8
Apr. 17	R. A. Switzer	2.18	56	17	.....do	2.15	51.8
20	.....do	2.20	60.7	18	J. C. Dort	2.24	54.2
29	.....do	2.50	78.6	24	R. A. Switzer	2.05	41.5
May 4	J. C. Dort	2.41	63.1	July 12	H. L. Stoner	1.75	17.9
20	R. A. Switzer	2.50	77.6	15	R. A. Switzer	1.73	19.1
21	.....do	2.35	68.3	Aug. 21	H. L. Stoner	1.30	4.3
June 3	.....do	2.27	56.0	Sept. 23	C. A. McClelland	1.48	8.3

NOTE.—All the above measurements, except those made by J. C. Dort and H. L. Stoner, were made by hydrographers of Twin Falls Oakley Land & Water Co.

Daily gage height, in feet, and discharge, in second-feet, of Goose Creek above Trapper Creek, near Oakley, Idaho, for the year ending Sept. 30, 1911.

Day.	April.		May.		June.		July.		August.		September.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height	Discharge.	Gage height.	Discharge
1	......	......	......	68	......	54	1.98	32	1.68	16	1.31	4.5
2	......	......	......	65	......	53	1.91	28	1.68	16	1.30	4.3
3	......	......	......	62	2.25	52	1.83	23	1.67	15	1.30	4.3
4	......	......	2.34	60	2.27	54	1.83	23	1.65	15	1.30	4.3
5	......	......	2.36	61	2.26	53	1.86	25	1.64	14	1.33	4.8
6	......	......	2.39	64	2.22	50	1.87	25	1.63	14	1.28	4.0
7	......	......	2.47	72	2.20	48	1.85	24	1.62	13	1.36	5.6
8	......	......	2.54	79	2.18	46	1.83	23	1.58	12	1.36	5.6
9	......	......	2.55	80	2.16	45	1.81	22	1.53	10	1.31	4.5
10	......	......	2.54	79	2.13	42	1.79	21	1.50	9.2	1.27	3.9
11	......	......	2.51	76	2.11	41	1.77	20	1.48	8.7	1.25	3.6
12	......	......	2.48	73	2.07	38	1.76	20	1.49	8.9	1.25	3.6
13	......	......	2.48	73	2.06	37	1.75	19	1.47	8.4	1.29	4.2
14	......	......	2.47	72	2.11	41	1.74	19	1.44	7.6	1.38	6.1
15	......	......	2.45	70	2.14	43	1.72	18	1.41	6.8	1.35	5.4
16	......	......	......	70	2.15	44	1.70	17	1.40	6.5	1.46	8.1
17	......	......	......	71	2.15	44	1.68	16	1.39	6.3	1.45	7.8
18	......	......	......	72	2.11	41	1.67	15	1.36	5.6	1.44	7.6
19	......	......	......	73	2.02	34	1.69	16	1.31	4.5	1.45	7.8
20	......	......	2.49	74	2.06	37	1.70	17	1.30	4.3	1.44	7.6
21	......	......	2.36	61	2.05	36	1.70	17	1.29	4.2	1.44	7.6
22	......	......	2.36	61	2.02	34	1.70	17	1.29	4.2	1.45	7.8
23	......	......	2.35	60	1.97	31	1.71	17	1.29	4.2	1.47	8.4
24	......	......	2.35	60	1.93	29	1.70	17	1.29	4.2	1.50	9.2
25	......	......	2.35	60	1.90	27	1.69	16	1.29	4.2	1.53	10
26	......	......	2.36	61	1.83	23	1.69	16	1.30	4.3	1.53	10
27	......	......	2.36	61	1.77	20	1.69	16	1.31	4.5	1.54	11
28	......	......	......	60	1.79	21	1.70	17	1.31	4.5	1.53	10
29	2.48	73	......	59	1.83	23	1.72	18	1.32	4.7	1.54	11
30	......	71	......	58	1.92	28	1.70	17	1.33	4.8	1.55	11
31	......	......	......	56	......	......	1.69	16	1.32	4.7	......	......

NOTE.—Discharge determined from rating curve well defined between 4 and 100 second-feet. For days for which record is missing automatic gage was not working; discharge interpolated.

Monthly discharge of Goose Creek above Trapper Creek, near Oakley, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
May	80	56	66.8	4,110	B.
June	54	20	39.0	2,320	A.
July	32	15	19.6	1,210	A.
August	16	4.2	8.07	496	A.
September	11	3.6	6.79	404	A.
The period				8,540	

GOOSE CREEK NEAR OAKLEY, IDAHO.

Location.—At the gristmill about half a mile below the Oakley dam. Previous to the completion of the dam the station was located at a wagon bridge in sec. 30, T. 14 S., R. 22 E., 1 mile above the dam, one-eighth mile below Trapper Creek, and 6 miles south of Oakley post office.

Records available.—May 26, 1909, to December 31, 1910, at the old station; January 1 to June 30, 1911, at the gristmill.

Drainage area.—Not measured.

Gage.—Vertical staff attached to bridge at old station; type of gage at gristmill station unknown.

Discharge measurements.—Made from the wagon bridge above the dam or by wading.

Winter flow.—Affected by ice at both locations.

Accuracy.—Results at the upper station are good. The results at the gristmill station were affected by artificial control and are only fair.

Cooperation.—Gage-height record and many of the discharge measurements furnished by the Twin Falls Oakley Land & Water Co.

Discharge measurements of Goose Creek near Oakley, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 19	E. A. Porter	1.16	2.80	Apr. 26	R. A. Switzer	2.40	76.6
				May 3	J. C. Dort	2.60	88.5
1911.				21	R. A. Switzer	2.69	122
Feb. 20[a]	Lynn Crandall	2.85	48.6	30	do	2.65	97.7
24	Porter and McClelland	2.20	41.5	31	do	2.71	114
Mar. 7	C. A. McClelland	3.75	279	June 5	do	2.45	92.9
8	do	4.20	393	6	do	2.54	98.9
9	do	4.70	576	12	H. L. Stoner	1.90	24.6
Apr. 8	R. A. Switzer	2.50	86.9	18	Dort and Switzer	2.43	64.7
8	do	2.60	107	21	R. A. Switzer	2.32	66.7
16	do	2.25	83.9	26	do	1.94	42.8
18	do	2.20	73.0	Aug. 21	H. L. Stoner	1.40	10.4

[a] Ice at gage.

NOTE.—All of above measurements, except those made by Lynn Crandall, J. C. Dort, and H. L. Stoner were made by hydrographers of Twin Falls Oakley Land & Water Co.

Daily gage height, in feet, of Goose Creek near Oakley, Idaho, for the year ending Sept. 30, 1911.

[H. C. Lamons, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.
1	1.25	1.5	1.55	2.10	5.22	2.75	2.45	2.65	2.20
2	1.25	1.5	1.55	2.11	5.10	2.50	2.60	2.55	2.30
3	1.25	1.5	1.55	2.10	4.95	2.80	2.70	2.60	2.25
4	1.25	1.55	1.55	2.18	....	3.00	2.75	2.50	2.30
5	1.25	1.5	1.5	2.26	2.80	3.10	2.70	2.50	2.20
6	1.25	1.5	1.55	2.32	2.62	3.32	2.70	2.57	2.15
7	1.25	1.5	1.5	2.32	2.48	3.75	2.65	2.60	2.15
8	1.25	1.5	1.5	2.30	2.10	4.30	2.75	2.62	2.15
9	1.3	1.45	1.5	2.32	1.78	4.70	2.60	2.68	2.20
10	1.25	1.45	1.5	2.40	2.35	4.00	2.50	2.58	2.20
11	1.25	1.45	1.55	2.25	2.40	5.75	2.45	2.56	2.25
12	1.25	1.4	1.6	2.35	2.40	4.42	2.40	2.58	2.18
13	1.25	1.4	1.6	2.25	2.50	3.10	2.40	2.63	2.15
14	1.25	1.45	1.65	2.20	2.64	2.80	2.35	2.80	2.25
15	1.25	1.45	1.7	2.16	2.20	2.75	2.32	2.75	2.35
16	1.3	1.5	1.7	2.10	2.10	2.80	2.28	2.65	2.15
17	1.35	1.55	1.6	2.10	....	2.90	2.35	2.75	2.20
18	1.4	1.5	1.35	2.25	....	2.70	2.45	2.75	2.15
19	1.4	1.6	1.35	2.20	....	2.60	2.40	2.70	2.15
20	1.45	1.5	1.3	2.12	2.85	2.65	2.45	2.65	2.25
21	1.4	1.6	1.35	2.10	2.70	2.80	2.75	2.65	2.20
22	1.4	1.55	1.35	2.00	2.90	2.85	2.70	2.65	2.20
23	1.4	1.6	1.35	2.00	2.70	2.85	2.70	2.70	2.05
24	1.45	1.6	1.35	2.06	2.65	2.75	2.75	2.65	2.10
25	1.45	1.6	1.3	2.48	2.90	2.82	2.75	2.65	2.10
26	1.45	1.55	1.3	3.62	2.35	2.70	2.85	2.70	2.10
27	1.45	1.55	1.3	3.25	2.70	2.52	2.80	2.65	2.15
28	1.45	1.55	1.3	2.95	2.65	2.70	2.90	2.55	1.95
29	1.45	1.55	1.3	2.62	....	2.62	2.95	2.40	1.95
30	1.5	1.55	1.3	4.20	....	2.60	2.80	2.35	2.00
31	1.5	....	1.3	5.20	....	2.52	....	2.35	....

NOTE.—Gage heights Oct. 1 to Dec. 31 refer to the gage at the bridge above the dam. Ice existed during the latter part of December, but it is believed the records were only slightly affected thereby. The records for Jan. 1 to 24 and Feb. 8 to 26 were affected by ice at the gristmill station.

Daily discharge, in second-feet, of Goose Creek near Oakley, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.
1	27	37	39	....	665	95	86	111	60
2	27	37	39	....	631	68	104	98	70
3	27	37	39	....	589	101	118	104	65
4	27	39	39	....	345	130	126	91	70
5	27	37	37	....	101	146	118	91	60
6	27	37	39	....	80	188	118	100	56
7	27	37	37	....	66	282	111	104	56
8	27	37	37	....	....	417	126	107	56
9	29	35	37	....	....	578	104	115	42
10	27	35	37	....	....	393	91	101	42
11	27	35	39	....	....	879	86	99	46
12	27	33	41	....	....	502	99	101	41
13	27	33	41	....	....	184	99	108	38
14	27	35	44	....	....	133	93	133	46
15	27	35	46	....	....	126	89	126	54
16	29	37	46	....	....	133	85	111	38
17	31	39	41	....	....	149	93	126	42
18	33	37	31	....	....	118	106	126	38
19	33	41	31	....	....	104	99	118	38
20	35	37	29	....	....	111	106	111	65
21	33	41	31	....	....	133	126	111	60
22	33	39	31	....	....	141	118	111	60
23	33	41	31	....	....	141	118	118	47
24	35	41	31	....	....	126	126	111	51
25	35	41	29	66	....	136	126	111	51
26	35	39	29	252	....	118	141	118	51
27	35	39	29	174	89	94	133	111	56
28	35	39	29	122	84	118	149	98	40
29	35	39	29	80	....	107	158	80	40
30	37	39	29	392	....	104	133	75	43
31	37	....	29	659	....	94	....	75	....

Monthly discharge of Goose Creek near Oakley, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	37	27	30.7	1,890	B.
November	41	33	37.6	2,240	C.
December	46	29	35.4	2,180	C.
January	659	....	79.5	4,890	C.
February	665	....	125	6,940	C.
March	879	68	198	12,200	B.
April	158	85	113	6,720	B.
May	133	75	106	6,520	B.
June	70	38	50.7	3,020	B.
The period	....	....	....	46,600	

NOTE.—See footnote to table of daily discharge.

TRAPPER CREEK NEAR OAKLEY, IDAHO.

Location.—In sec. 34, T. 14 S., R. 21 E. Boise meridian, above the flow line of the Goose Creek reservoir and about 4 miles above the junction of Trapper Creek and Goose Creek; about 5 miles above the dam and ½ mile inside the east boundary of the Minidoka National Forest.

Records available.—May 1 to September 30, 1911.

Drainage area.—Not measured.

Gage.—Lietz automatic, set by a vertical staff gage on the left bank about 15 feet downstream from the automatic gage which was located at the footbridge.

Channel.—Fairly permanent.

Discharge measurements.—Made by wading or from the footbridge.

Winter flow.—Ice present.

Accuracy.—Automatic gage record not entirely satisfactory at times and results are approximate.

Cooperation.—Station installed and gage heights and some measurements furnished by the Twin Falls Oakley Land & Water Co.

Discharge measurements of Trapper Creek near Oakley, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 4	J. C. Dort	1.80	19.9	June 18	J. C. Dort	1.70	18.2
May 28[a]	R. A. Switzer	1.85	24.3	July 12	H. L. Stoner	1.59	11.1
June 10[a]	.....do	1.72	20.8	Aug. 21	.....do	1.30	7.4

[a] Measurement made by Twin Falls Oakley Land & Water Co.

Daily gage height, in feet, and discharge, in second-feet, of Trapper Creek near Oakley, Idaho, for the year ending Sept. 30, 1911.

[R. A. Switzer, observer.]

Day.	May.		June.		July.		August.		September.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	....	20	....	21	1.73	18	1.35	7.9	1.28	6.7
2	1.78	20	....	21	1.69	17	1.35	7.9	1.30	7.0
3	1.78	20	1.79	20	1.66	16	1.34	7.7	1.31	7.2
4	1.80	20	1.80	20	1.64	15	1.34	7.7	1.31	7.2
5	1.85	22	1.78	20	1.63	15	1.34	7.7	1.32	7.4
6	1.88	23	1.77	19	1.62	14	....	7.6	1.33	7.5
7	1.86	23	1.75	19	1.63	15	....	7.6	1.32	7.4
8	1.86	23	1.75	19	1.61	14	....	7.5	1.31	7.2
9	1.87	23	1.72	18	1.61	14	....	7.5	1.30	7.0
10	1.89	24	1.72	18	1.60	14	....	7.4	1.28	6.7
11	1.87	23	1.71	17	1.58	13	....	7.4	1.28	6.7
12	1.86	23	1.69	17	1.57	13	....	7.3	1.29	6.8
13	1.84	22	1.71	17	1.56	13	....	7.3	1.33	7.5
14	1.83	22	1.72	18	1.55	12	....	7.2	1.31	7.2
15	1.91	25	1.72	18	1.55	12	....	7.2	1.31	7.2
16	1.98	27	1.75	19	1.54	12	....	7.2	1.31	7.2
17	1.94	26	1.77	19	1.53	12	....	7.1	1.32	7.4
18	1.93	25	1.73	18	1.55	12	....	7.1	1.33	7.5
19	1.92	25	1.64	15	1.55	12	1.30	7.0	1.33	7.5
20	1.88	23	1.70	17	1.57	13	1.30	7.0	1.33	7.5
21	1.87	23	1.67	16	1.58	13	1.29	6.8	1.33	7.5
22	....	22	1.63	15	1.56	13	1.29	6.8	1.34	7.7
23	....	22	1.57	13	1.54	12	1.28	6.7	1.36	8.1
24	....	22	1.60	14	1.50	11	1.28	6.7	1.37	8.3
25	....	22	1.59	13	1.49	11	1.28	6.7	1.36	8.1
26	....	22	1.59	13	1.45	9.9	1.28	6.7	1.36	8.1
27	....	22	1.60	14	1.43	9.5	1.28	6.7	1.37	8.3
28	....	21	1.63	15	1.40	8.8	1.28	6.7	1.38	8.4
29	....	21	1.68	16	1.37	8.3	1.28	6.7	1.36	8.1
30	....	21	1.86	23	1.38	8.4	1.28	6.7	1.35	7.9
31	....	21	....	....	1.36	8.1	1.29	6.8	....	....

NOTE.—Automatic gage failed, discharge interpolated, on days for which gage heights are missing. Discharge Oct. 1 to Dec. 31, for the station above dam, determined from a fairly well-defined rating curve; discharge for open-water periods at the gristmill station obtained from well-defined curves applicable as follows: Jan. 1 to Mar. 8, and June 9 to 19; Mar. 9 to Apr. 11, Apr. 12 to 20, Apr. 21 to June 8, and June 20 to 30. Mean discharge Jan. 1 to 24 estimated at 30 second-feet, and Feb. 8 to 26 at 45 second-feet.

Monthly discharge of Trapper Creek near Oakley, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
May	27	20	22.5	1,380	C.
June	23	13	17.4	1,040	B.
July	18	8.1	12.5	769	B.
August	7.9	6.7	7.17	441	C.
September	8.4	6.7	7.48	445	B.

BIG COTTONWOOD CREEK NEAR OAKLEY, IDAHO.

Location.—In sec. 19, T. 13 S., R. 21 E. Boise meridian, about 200 yards above the south line of Roark's ranch; 10 miles northwest of Oakley post office; below all tributaries except Cedar Creek.

Records available.—November 27, 1909, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff spiked to a cottonwood tree on the right bank about 600 feet from the upper fence of Roark's ranch; datum unchanged.

Channel.—Gravel and sand; shifts; leaves and trash collect during low water.

Discharge measurements.—By wading or from a footbridge just above the gage.

Winter flow.—Some ice present.

Diversions.—Above diversions except for one small ranch ditch used during very dry years.

Accuracy.—Daily estimates approximate for periods of unstable conditions of channel.

Discharge measurements of Big Cottonwood Creek near Oakley, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*
Oct. 7	Lynn Crandall	1.02	0.7
1911.			
June 17	J. C. Dort	1.66	12.2
July 11	Stoner and Switzer	1.2	2.7
Aug. 20	H. L. Stoner	.88	.1

Daily gage height, in feet, of Big Cottonwood Creek near Oakley, Idaho, for the year ending Sept. 30, 1911.

[J. H. Roark, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.95	1.2	1.15	1.0	1.4	1.1	1.6	2.0	2.05	1.40	1.05	0.9
2	.95	1.25	1.2	1.0	1.3	1.1	1.8	2.1	2.05	1.40	1.05	.9
3	.95	1.25	1.2	1.1	1.1	1.1	1.7	2.2	2.00	1.35	1.0	.9
4	1.0	1.25	1.2	1.1	1.2	1.1	1.65	2.3	2.05	1.30	1.0	.9
5	1.0	1.2	1.2	1.1	1.2	1.15	1.6	2.6	2.00	1.30	1.0	.9
6	1.05	1.2	1.2	1.1	1.2	1.15	1.5	2.8	1.90	1.30	1.0	.9
7	1.05	1.2	1.2	1.1	1.0	1.2	1.45	2.6	1.90	1.30	1.0	.9
8	1.05	1.2	1.2	1.1	1.1	1.2	1.4	2.55	1.90	1.30	1.0	.9
9	1.05	1.2	1.2	1.1	1.05	1.15	1.45	2.5	1.90	1.25	1.0	.9
10	1.05	1.2	1.2	1.15	1.2	1.15	1.45	2.4	1.85	1.25	1.0	.9
11	1.05	1.2	1.2	1.1	1.2	1.15	1.4	2.35	1.80	1.20	.95	.9
12	1.05	1.2	1.2	1.1	1.1	1.1	1.3	2.35	1.75	1.20	.9	.9
13	1.1	1.2	1.2	1.15	1.2	1.1	1.15	2.35	1.60	1.20	.9	.9
14	1.1	1.2	1.15	1.1	1.05	1.1	1.1	2.35	1.70	1.20	.9	.9
15	1.1	1.2	1.15	1.1	1.1	1.2	1.25	2.5	1.75	1.20	.9	.9
16	1.1	1.2	1.1	1.05	1.0	1.2	1.35	2.4	1.70	1.15	.9	.9
17	1.15	1.2	1.1	1.0	1.0	1.2	1.35	2.4	1.70	1.10	.9	.9
18	1.15	1.2	1.05	1.1	1.1	1.2	1.35	2.4	1.60	1.10	.9	.9
19	1.15	1.2	1.1	1.1	1.2	1.25	1.4	2.4	1.60	1.10	.85	.9
20	1.15	1.2	1.05	1.1	1.1	1.3	1.3	2.3	1.60	1.10	.85	.9
21	1.15	1.2	1.1	1.3	1.0	1.3	1.4	2.3	1.55	1.10	.9	.9
22	1.15	1.2	1.05	1.05	1.0	1.35	1.4	2.35	1.50	1.15	.9	.95
23	1.15	1.2	1.1	1.0	1.1	1.35	1.45	2.4	1.45	1.10	.9	1.0
24	1.2	1.2	1.1	1.1	1.1	1.35	1.55	2.4	1.45	1.10	.9	1.0
25	1.2	1.2	1.1	1.2	1.1	1.35	1.7	2.35	1.45	1.10	.9	1.0
26	1.2	1.2	1.0	1.2	1.1	1.1	2.0	2.35	1.40	1.10	.9	1.0
27	1.2	1.1	1.1	1.1	1.0	1.25	2.1	2.3	1.40	1.10	.9	1.0
28	1.2	1.15	1.1	1.1	1.1	1.25	2.15	2.2	1.40	1.05	.95	1.0
29	1.2	1.15	1.1	1.1	....	1.25	2.05	2.15	1.40	1.05	.9	1.0
30	1.2	1.15	1.1	1.4	....	1.35	2.0	2.1	1.40	1.10	.9	1.05
31	1.2	....	1.1	1.4	....	1.5	....	2.1	....	1.10	.9	....

NOTE.—Gage heights probably not seriously affected by ice.

Daily discharge, in second-feet, of Big Cottonwood Creek near Oakley, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.6	4.4	3.4	0.9	9.8	2.3	16	29	27	6.0	1.0	0.1
2	.6	5.7	4.4	.9	7.0	2.3	22	32	27	6.0	1.0	.1
3	.6	5.7	4.4	2.3	2.3	2.3	19	36	25	5.1	.6	.1
4	.9	5.7	4.4	2.3	4.4	2.3	17	40	26	4.2	.6	.1
5	.9	4.4	4.4	2.3	4.4	3.4	16	51	24	4.2	.6	.1
6	1.6	4.4	4.4	2.3	4.4	3.4	13	59	22	4.2	.6	.1
7	1.6	4.4	4.4	2.3	.9	4.4	11	50	22	4.2	.6	.1
8	1.6	4.4	4.4	2.3	2.3	4.4	9.8	48	22	4.2	.6	.1
9	1.6	4.4	4.4	2.3	1.6	3.4	11	46	22	3.4	.6	.1
10	1.6	4.4	4.4	3.4	4.4	3.4	11	42	20	3.4	.6	.1
11	1.6	4.4	4.4	2.3	4.4	3.4	9.8	40	18	2.7	.4	.1
12	1.6	4.4	4.4	2.3	2.3	2.3	7.0	40	17	2.7	.1	.1
13	2.3	4.4	4.4	3.4	4.4	2.3	3.4	40	12	2.7	.1	.1
14	2.3	4.4	3.4	2.3	1.6	2.3	2.3	39	14	2.7	.1	.1
15	2.3	4.4	3.4	2.3	2.3	4.4	5.7	45	16	2.7	.1	.1
16	2.3	4.4	2.3	1.6	.9	4.4	8.4	41	14	2.0	.1	.1
17	3.4	4.4	2.3	.9	.9	4.4	8.4	41	14	1.4	.1	.1
18	3.4	4.4	1.6	2.3	2.3	4.4	8.4	41	11	1.4	.1	.1
19	3.4	4.4	2.3	2.3	4.4	5.7	9.8	41	11	1.4	.05	.1
20	3.4	4.4	1.6	2.3	2.3	7.0	7.0	37	11	1.4	.05	.1
21	3.4	4.4	2.3	7.0	.9	7.0	9.8	37	9.4	1.4	.1	.1
22	3.4	4.4	1.6	1.6	.9	8.4	9.8	38	8.2	2.0	.1	.4
23	3.4	4.4	2.3	.9	2.3	8.4	11	40	7.1	1.4	.1	.5
24	4.4	4.4	2.3	2.3	2.3	8.4	14	40	7.1	1.4	.1	.5
25	4.4	4.4	2.3	4.4	2.3	8.4	19	38	7.1	1.4	.1	.5
26	4.4	4.4	.9	4.4	2.3	2.3	29	38	6.0	1.4	.1	.5
27	4.4	2.3	2.3	2.3	.9	5.7	32	36	6.0	1.4	.1	.5
28	4.4	3.4	2.3	2.3	2.3	5.7	34	32	6.0	1.0	.4	.5
29	4.4	3.4	2.3	2.3	....	5.7	31	30	6.0	1.0	.1	.5
30	4.4	3.4	2.3	9.8	....	8.4	29	29	6.0	1.4	.1	.7
31	4.4	....	2.3	9.8	....	13	....	29	....	1.4	.1	....

NOTE.—Discharge determined from several rating curves, all of which are fairly well defined. No corrections made for any possible effect of ice.

Monthly discharge of Big Cottonwood Creek near Oakley, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet.)	Accuracy.
	Maximum.	Minimum.	Mean.		
October	4.4	0.6	2.68	165	A.
November	5.7	2.3	4.36	259	A.
December	4.4	.9	3.11	191	B.
January	9.8	.9	2.92	180	C.
February	9.8	.9	2.91	162	C.
March	13	2.3	4.96	305	B.
April	34	2.3	14.5	863	B.
May	59	29	39.5	2,430	A.
June	27	6.0	14.8	881	A.
July	6.0	1.0	2.62	161	A.
August	1.0	.05	.30	18.6	B.
September	.7	.1	.22	13.1	B.
The year	59	.1	7.77	5,630	

ROCK CREEK NEAR ROCK CREEK, IDAHO.

Location.—In sec. 13, T. 12 S., R. 18 E. Boise meridian, on the ranch of E. M., Crockett, about 3 miles above Rock Creek post office. McMullen Creek enters below the station.

Records available.—November 28, 1909, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on left bank.

Channel.—Gravel and shifts.

Discharge measurements.—Made by wading at low water or from wagon bridge at the gage during high stages.

Winter flow.—Not seriously affected by ice.

Diversions.—It is proposed to divert water near the station and into Big Cottonwood for storage in the Goose Creek reservoir. There is also a dam site near the station.

Accuracy.—Results fairly reliable.

Discharge measurements of Rock Creek near Rock Creek, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
1910.				1911.			
Oct. 5	Lynn Crandall	0.50	7.5	May 22	J. C. Dort	1.82	76.4
Nov. 30	do	.5	13.5	June 13	do	1.00	33.4
				Aug. 25	H. L. Stoner	.3	5.2

Daily gage height, in feet, of Rock Creek near Rock Creek, Idaho, for the year ending Sept. 30, 1911.

[E. M. Crockett, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.6	0.5	0.5	0.5	1.2	0.6	1.4	1.7	1.5	0.9	0.5	0.3
2	.6	.5	.5	.5	1.1	.7	1.5	1.6	1.5	.8	.5	.3
3	.6	.5	.5	.5	.9	.7	1.5	1.7	1.4	.8	.4	.3
4	.6	.5	.6	.5	.8	.7	1.4	1.9	1.4	.8	.4	.4
5	.5	.5	.6	.6	.8	.7	1.4	2.1	1.4	.7	.4	.4
6	.5	.5	.5	.6	.8	.7	1.3	2.4	1.4	.7	.4	.4
7	.5	.5	.5	.6	.8	.7	1.2	2.3	1.4	.7	.4	.4
8	.5	.6	.5	.6	.7	.8	1.1	2.2	1.4	.6	.4	.4
9	.5	.6	.6	.6	.7	.7	1.2	2.1	1.3	.6	.4	.5
10	.5	.6	.6	.6	.8	.7	1.0	1.9	1.3	.6	.4	.4
11	.5	.6	.6	.6	.8	.7	1.0	1.6	1.2	.6	.4	.4
12	.5	.6	.6	.6	.8	.7	1.0	1.5	1.2	.6	.4	.5
13	.5	.6	.6	.6	.8	.7	.9	1.6	1.0	.6	.4	.5
14	.5	.7	.5	.6	.7	.7	.9	1.6	1.0	.6	.4	.5
15	.5	.7	.5	.6	.7	.8	.9	1.8	1.2	.6	.4	.4
16	.6	.6	.5	.6	.7	.8	.9	2.1	1.1	.6	.4	.4
17	.6	.5	.5	.5	.8	.8	.9	2.1	1.0	.6	.4	.4
18	.6	.6	.5	.6	.7	.8	1.0	2.0	1.0	.6	.4	.4
19	.6	.6	.5	.6	.7	.9	1.0	2.0	1.0	.6	.4	.4
20	.6	.6	.5	.7	.7	.9	1.0	1.9	1.0	.6	.4	.4
21	.6	.6	.5	.7	.7	.9	1.0	1.9	1.0	.6	.4	.4
22	.6	.6	.5	.7	.7	.9	1.0	1.9	.9	.6	.4	.4
23	.6	.6	.5	.6	.7	.9	1.1	1.9	.9	.6	.3	.4
24	.6	.6	.5	.7	.7	1.1	1.2	2.0	.8	.5	.3	.4
25	.6	.6	.5	.7	.6	1.2	1.4	2.0	.8	.5	.3	.4
26	.6	.6	.5	.7	.6	1.1	1.5	2.0	.8	.5	.3	.4
27	.6	.6	.5	.7	.6	1.1	1.7	1.9	.8	.5	.3	.4
28	.5	.6	.5	.7	.6	1.0	1.8	1.8	.8	.5	.3	.4
29	.5	.6	.5	.7	....	1.1	1.7	1.7	.8	.5	.3	.4
30	.5	.5	.5	.9	....	1.2	1.7	1.7	.9	.5	.3	.4
31	.5	....	.4	1.4	....	1.2	....	1.5	....	.5	.3	.....

NOTE.—Gage heights probably not seriously affected by ice.

Daily discharge, in second-feet, of Rock Creek near Rock Creek, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	11.2	10	14	13	43	16	53	69	58	27	11	6
2	11.2	10	14	13	38	20	58	63	58	23	11	6
3	11.2	10	14	13	28	20	58	69	53	23	8	6
4	11.2	10	18	13	24	20	53	81	53	23	8	8
5	8.4	11	18	16	24	20	53	93	53	19	8	8
6	8.4	11	14	16	24	20	48	111	53	19	8	8
7	8.4	11	14	16	24	20	43	105	53	19	8	8
8	8.4	14	14	16	20	24	38	99	53	15	8	8
9	8.4	14	18	16	20	20	43	93	48	15	8	11
10	8.4	14	18	16	24	20	33	81	48	15	8	8
11	8.4	15	18	16	24	20	33	63	43	14	6	8
12	8.4	15	18	16	24	20	33	58	43	14	8	11
13	8.4	15	18	16	24	20	28	63	33	14	8	11
14	8.4	19	14	16	20	20	28	63	33	14	8	11
15	8.4	19	14	16	20	24	28	75	43	14	8	8
16	12	15	14	16	20	24	28	93	38	14	8	8
17	12	12	14	13	24	24	28	93	33	14	8	8
18	12	15	14	16	20	24	33	87	33	14	8	8
19	12	16	14	16	20	28	33	87	33	14	8	8
20	12	16	14	20	20	28	33	81	33	14	8	8
21	12	16	14	20	20	28	33	81	33	14	8	8
22	12	16	14	20	20	28	33	81	28	14	8	8
23	12	16	14	16	20	28	38	81	28	14	6	8
24	13	16	14	20	20	38	43	87	24	11	6	8
25	13	17	14	20	16	43	53	87	24	11	6	8
26	13	17	14	20	16	38	58	87	24	11	6	8
27	13	17	14	20	16	38	69	81	24	11	6	8
28	10	17	14	20	16	33	75	75	24	11	6	8
29	10	17	14	20	....	38	69	69	24	11	6	8
30	10	14	14	28	....	43	69	69	27	11	6	8
31	10	....	10.6	53	....	43	....	58	....	11	6	....

NOTE.—Discharge Oct. 1 to Dec. 31, except Oct. 16 to Nov. 29, determined from a curve not very well defined; Oct. 16 to Nov. 29 and July 24 to Sept. 30, indirect method for shifting channel used; Jan. 1 to June 29 and July 24 to Sept. 30, curves well defined.

Monthly discharge of Rock Creek near Rock Creek, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet.)	Accuracy.
	Maximum.	Minimum.	Mean.		
October	13	8.4	10.5	646	B.
November	19	10	14.5	863	C.
December	18	10.6	14.8	910	B.
January	53	13	18.3	1,130	B.
February	43	16	22.5	1,250	B.
March	43	16	26.8	1,650	A.
April	75	28	44.2	2,630	A.
May	111	58	80.1	4,930	A.
June	58	24	38.5	2,290	A.
July	27	11	15.1	928	C.
August	11	6	7.6	467	B.
September	11	6	8.2	488	A.
The year	111	6	25.1	18,200	

SALMON FALLS CREEK NEAR SAN JACINTO, NEV.

Location.—In sec. 23, T. 47 N., R. 64 E. Mount Diablo base and meridian, at the upper end of the canyon, just below the mouth of Shoshone Creek; about 6 miles north of San Jacinto; above the backwater from Salmon dam about 20 miles down the river.

Records available.—September 17, 1909, to September 30, 1911. Records from May 31, 1909, to May 28, 1910, obtained just above dam, at a station known as Salmon Falls Creek near Twin Falls; no diversions and no important tributaries between the two stations.

Drainage area.—Not measured.

Gage.—Friez automatic gage installed June 5, 1910. A staff gage a short distance upstream and at different datum, was used September 17, 1909, to June 30, 1910.

Channel.—Hard bottom with a few rocks; fairly permanent.

Discharge measurements.—Made from a cable 10 feet below the gage or, at low stages, by wading.

Winter flow.—Affected by ice at times.

Diversion and storage.—Ranch ditches divert water above the station. The dam of the Twin Falls Salmon River Land & Water Co. will store all the water in Salmon Falls River, and the records of this station will indicate practically the entire amount running into the reservoir.

Accuracy.—Rating curves change somewhat, but records are reliable.

Cooperation.—Gage heights furnished by the Twin Falls Salmon River Land & Water Co.

Discharge measurements of Salmon Falls Creek near San Jacinto, Nev., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 16	A. B. Purton	3.48	196	July 26	H. L. Stoner	2.54	34.5
May 25	J. C. Dort	[a]3.72	267	Aug. 23	.....do	2.34	18.5
June 15	.....do	3.97	309				

[a] Height not consistent with automatic gage record. Automatic gage could not be read at time of measurement.

Daily gage height, in feet, of Salmon Falls Creek near San Jacinto, Nev., for the year ending Sept. 30, 1911.

[Farrar and Bouton, observers.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.60	2.72	2.77	2.54	5.69	......	3.87	3.85	......	3.20	2.47	2.34
2	2.62	2.72	2.77	2.53	4.98	......	3.97	3.81	3.90	3.17	2.46	2.34
3	2.62	2.73	2.78	2.59	3.97	2.93	4.06	3.75	4.03	3.11	2.46	2.34
4	2.62	2.73	2.79	2.69	3.61	2.99	4.08	3.69	4.12	3.06	2.47	2.35
5	2.63	2.72	......	2.73	3.45	3.33	4.07	3.67	4.10	2.99	2.48	2.36
6	2.63	2.72	......	......	3.37	3.78	4.03	3.67	4.08	2.93	2.49	2.37
7	2.63	2.72	......	2.73	......	4.36	3.98	3.78	4.08	2.89	2.47	2.38
8	2.64	2.73	2.77	2.76	......	5.48	3.87	3.88	4.11	2.82	2.45	2.38
9	......	2.73	2.79	2.77	3.22	4.99	3.76	3.94	4.11	2.75	2.45	2.38
10	2.62	2.75	2.85	2.81	3.12	4.72	3.72	3.97	4.07	2.68	2.44	2.38
11	2.62	2.75	2.88	2.68	3.11	5 56	3.68	3.99	3.96	2.63	2.43	2.39
12	2.62	2.76	2.87	2.74	3.08	5.01	3.67	3.97	3.86	2.58	2.41	2.39
13	2.62	2.76	2.86	2.78	3.06	4.07	3.63	3.89	3.80	2.53	2.40	2.40
14	2.63	2.76	2.84	2.77	2.95	3.77	3.56	3.85	3.80	2.52	2.39	2.41
15	2.64	2.76	2.79	2.78	3.00	3.70	3.49	3.90	3.91	2.49	2.38	2.41
16	2.67	2.75	2.71	2.66	2.85	3.87	3.48	4.00	3.94	2.49	2.38	2.46
17	2.67	2.75	2.74	2.63	......	4.01	3.46	4.10	3.96	2.49	2.39	2.45
18	2.67	2.77	2.80	2.75	2.97	3.95	3.42	4.13	3.96	2.50	2.39	2.46
19	2.67	2.78	......	2.81	......	4.87	3.37	4.10	4.04	2.51	2.38	2.47
20	2.66	2.78	......	2.82	......	3.82	3.37	4.00	3.88	2.54	2.37	2.48
21	2.66	2.78	......	2.72	......	3.84	3.39	3.97	3.75	2.56	2.36	2.49
22	2.66	2.78	......	2.57	......	3.90	3.42	3.91	3.64	2.58	2.35	2.49
23	2.72	2.79	......	2.56	......	3.95	3.43	3.88	3.52	2 59	2.34	2.50
24	2.72	2.81	......	2.73	......	4.05	3.42	3.87	3.48	2.59	2.34	2.51
25	2.72	2.81	......	3.19	2.90	4.08	3.44	3.87	3.45	2.58	2.34	2.52
26	2.72	2.72	......	3.48	......	3.96	3.49	3.88	3.38	2.56	2.34	2.52
27	2.71	2.70	......	3.38	......	3.82	3.58	3.96	3.31	2.54	2.34	2.52
28	2.71	2.78	......	3.18	......	3.71	3.68	4.01	3.26	2.52	2.34	2.53
29	2.71	2.77	2.70	3.07	......	3.65	3.80	3.95	3.23	2.49	2.34	2.54
30	2.71	2.77	2.72	4.32	......	3.61	3.85	3.92	3.22	2.50	2.34	2.55
31	2.72	......	2.68	6.39	......	3.72	......	......	......	2.48	2.34	......

NOTE.—Gage heights probably slightly affected by ice during last part of November and during December, and to a greater extent Jan. 1 to 23 and Feb. 7 to 8. Gage heights May 14 to 27 subject to some error because of doubtful record of automatic gage.

Daily discharge, in second-feet, of Salmon Falls Creek near San Jacinto, Nev., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	46	61	67	......	758	80	286	281	295	138	28	18
2	48	61	67	......	567	80	310	271	293	132	27	18
3	48	62	68	......	310	89	331	258	324	121	27	18
4	48	62	70	......	225	99	336	244	346	112	28	19
5	50	61	70	......	190	164	334	239	341	99	29	20
6	50	61	69	......	173	264	324	239	336	89	30	20
7	50	61	68	......	160	405	312	264	336	82	28	21
8	51	62	67	......	150	702	286	288	343	72	26	21
9	50	62	70	......	142	569	260	303	343	62	26	21
10	48	64	78	......	123	497	251	310	334	52	26	21
11	48	64	82	......	121	723	241	315	307	46	25	21
12	48	66	81	......	115	575	239	310	283	40	23	21
13	48	66	79	......	112	334	230	291	269	34	22	22
14	50	66	77	......	92	262	214	281	269	33	21	23
15	51	66	70	......	101	246	199	293	295	30	21	23
16	54	64	59	......	76	286	197	317	303	30	21	27
17	54	64	63	......	75	319	192	341	307	30	21	26
18	54	67	71	......	75	305	183	348	307	31	21	27
19	54	68	70	......	75	537	173	341	327	32	21	28
20	53	68	69	......	75	274	173	317	288	35	20	29
21	53	68	67	......	70	279	177	310	258	38	20	30
22	53	68	65	......	70	293	183	295	232	40	19	30
23	61	70	64	......	70	305	186	288	205	41	18	31
24	61	72	63	59	70	329	183	286	197	41	18	32
25	61	72	62	136	70	336	188	286	190	40	18	33
26	61	61	61	197	75	307	199	288	175	38	18	33
27	59	58	60	175	75	274	219	307	160	35	18	33
28	59	68	59	134	75	248	241	319	150	33	18	34
29	59	67	59	114	......	234	269	305	144	30	18	35
30	59	67	61	395	......	225	281	298	142	31	18	36
31	61	......	56	953	......	251	......	296	......	29	18	......

NOTE.—Discharge Oct. 1 to Dec. 31 determined from a well-defined rating curve; discharge for open-water periods Jan. 1 to Sept 30 determined from a rating curve well defined between 20 and 600 second-feet and fairly well defined above 600 second-feet. Mean discharge Jan. 1 to 23 estimated at 45 second-feet. Discharge estimated or interpolated for days for which gage heights are missing in December, February and March.

Monthly discharge of Salmon Falls Creek near San Jacinto, Nev., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	61	46	53.2	3,270	B.
November	72	58	64.9	3,860	C.
December	82	....	61.0	3,750	D.
January	953	....	103	6,330	D.
February	758	70	153	8,500	C.
March	723	80	319	19,600	A.
April	336	173	240	14,300	A.
May	348	239	294	18,100	B.
June	346	142	270	16,100	A.
July	138	29	54.7	3,360	A.
August	30	18	22.3	1,370	A.
September	36	18	25.7	1,530	A.
The year	953	18	138	100,000	

CEDAR CREEK NEAR ROSEWORTH, IDAHO.

Location.—In sec. 12, T. 14 S., R. 13 E. Boise meridian, 500 or 600 feet above the dam site of the West End Twin Falls Co., 100 feet above the intake of the diversion tunnel; about 10 miles south of Roseworth post office and 7 miles west of the Salmon dam, on Salmon Falls River; about 2½ miles below the mouth of House Creek.

Records available.—May 30, 1909, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on right bank. Has shifted at times, but gage heights have been corrected to original gage datum.

Channel.—Sand and gravel.

Discharge measurements.—Made from a plank across the creek at the gage.

Winter flow.—Affected by ice to a slight extent.

Diversions.—Small ditches divert water above the station.

Accuracy.—Gage heights affected by backwater caused by growth of moss and by ice. Records approximate.

Discharge measurements of Cedar Creek near Roseworth, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 2	Lynn Crandall	2.22	17	May 26	J. C. Dort	2.62	28.3
Nov. 28	.....do	2.28	19	June 16	.....do	2.45	22.0
				July 25	H. L. Stoner	2.12	11.8
1911.				Aug. 23	.....do	1.89	8.9
Apr. 17	A. B. Purton	2.37	24.6				

Daily gage height, in feet, of Cedar Creek near Roseworth, Idaho, for the year ending Sept. 30, 1911.

[Robert Hoffman, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.15	2.2	2.25	2.45	3.0	1.95	2.75	2.75	2.3	2.40	2.08	1.88
2	2.25	2.25	2.3	2.5	2.45	2.0	3.05	2.8	2.48	2.3	2.12	1.92
3	2.25	2.2	2.25	2.05	2.7	1.95	2.95	2.75	2.68	2.15	2.08	1.9
4	2.3	2.25	2.3	2.1	2.25	2.2	2.95	2.8	2.7	2.15	2.12	1.93
5	2.25	2.2	2.25	2.05	2.35	2.7	2.75	2.8	2.65	2.08	2.1	1.9
6	2.25	2.2	2.25	2.05	2.25	3.05	3.05	2.95	2.42	2.05	2.1	1.92
7	2.25	2.3	2.3	2.1	2.3	3.7	2.95	3.1	2.45	2.08	2.12	1.98
8	2.2	2.25	2.25	2.05	2.5	3.5	2.75	2.9	2.62	2.02	2.08	1.88
9	2.25	2.3	2.5	2.1	2.45	3.3	2.8	2.9	2.6	2.02	2.12	1.92
10	2.2	2.25	2.45	2.05	2.05	3.25	2.45	2.85	2.3	1.98	2.02	1.88
11	2.2	2.25	2.55	2.05	2.1	3.05	2.45	2.75	2.25	1.98	2.02	1.88
12	2.25	2.3	2.5	2.1	2.1	2.4	2.45	2.55	2.3	2.02	2.08	1.95
13	2.2	2.25	2.3	2.05	2.05	2.1	2.35	2.45	2.25	1.98	2.02	1.88
14	2.25	2.3	2.3	2.2	2.3	2.4	2.4	2.5	2.3	2.02	2.05	1.92
15	2.2	2.2	2.15	2.05	2.25	2.45	2.35	2.55	2.55	1.98	2.0	1.85
16	2.25	2.2	2.15	2.05	2.25	2.7	2.35	3.1	2.44	1.98	1.98	1.85
17	2.3	2.3	2.2	2.1	2.3	2.75	2.4	2.9	2.4	2.05	2.02	1.92
18	2.25	2.25	2.15	2.05	2.05	2.7	2.35	2.85	2.35	2.05	1.98	1.88
19	2.3	2.25	2.1	2.1	2.1	2.8	2.4	2.9	2.4	2.10	2.02	1.92
20	2.25	2.2	2.05	2.05	2.05	2.75	2.45	2.8	2.35	2.08	1.98	1.9
21	2.25	2.3	2.15	2.05	2.15	2.75	2.8	2.55	2.28	2.08	1.95	1.92
22	2.3	2.3	2.2	2.1	2.2	2.8	2.8	2.6	2.3	2.1	1.92	2.0
23	2.25	2.35	2.05	2.05	2.15	2.8	2.75	2.55	2.16	2.0	1.85	1.95
24	2.3	2.4	2.1	2.1	2.1	3.25	2.8	2.6	2.2	2.05	1.9	2.0
25	2.25	2.35	2.05	2.15	2.05	3.3	2.75	2.55	2.12	2.05	1.85	1.95
26	2.25	2.15	2.05	2.1	1.95	2.75	2.8	2.6	1.99	2.08	1.85	1.95
27	2.25	2.2	2.1	2.1	2.15	2.65	3.2	2.6	2.08	2.12	1.92	2.0
28	2.2	2.25	2.0	2.05	2.1	2.5	3.25	2.55	2.25	2.08	1.88	1.95
29	2.25	2.4	2.1	2.1	....	2.5	3.05	2.6	2.25	2.15	1.92	2.0
30	2.2	2.3	2.25	2.8	....	2.5	2.75	2.40	2.39	2.1	1.88	1.95
31	2.2	....	2.05	3.35	....	2.35	....	2.3	....	2.1	1.88	....

NOTE.—Gage heights affected by small ice jams Jan. 1-2, 14, 25, Feb. 6 to 7, 14 to 17, 21 to 23, and 27 to 28.

Daily discharge, in second-feet, of Cedar Creek near Roseworth, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	16	17	19	17	48	14	38	36	19	19	11	9.2
2	18	18	20	17	27	16	50	38	24	17	13	10
3	18	17	20	17	36	14	46	36	30	14	12	9.5
4	19	18	21	18	21	20	46	38	31	14	13	11
5	18	17	20	17	24	36	38	38	29	12	13	9.5
6	18	17	20	17	20	50	50	43	21	12	13	11
7	18	19	22	18	20	82	46	49	22	12	13	12
8	17	18	21	17	29	72	38	41	27	11	12	10
9	18	19	26	18	27	62	40	41	26	11	13	11
10	17	18	25	17	17	60	27	39	18	10	11	10
11	17	18	28	17	18	50	27	35	17	10	11	10
12	18	19	27	18	18	26	27	27	18	11	12	12
13	17	18	21	17	17	18	24	24	17	10	11	10
14	18	19	22	17	17	26	26	25	18	11	12	11
15	17	17	18	17	17	27	24	27	25	10	11	9.7
16	18	17	19	17	17	36	24	48	22	11	10	9.7
17	19	19	20	18	17	38	26	40	20	12	11	11
18	18	18	19	17	17	36	24	37	19	12	10	11
19	19	18	18	18	18	40	26	39	20	13	11	12
20	18	17	17	17	17	38	27	35	19	12	10	11
21	18	19	19	17	17	38	39	26	17	11	10	12
22	19	19	20	18	18	40	39	28	18	12	9.2	13
23	18	21	17	17	18	40	37	26	14	10	8.0	12
24	19	22	18	18	18	60	39	28	15	10	9.0	13
25	18	21	17	18	17	62	37	26	13	10	8.0	12
26	18	16	17	18	14	38	39	28	10	11	8.0	12
27	18	17	18	18	14	34	56	28	12	10	9.2	13
28	17	18	16	17	14	29	58	26	16	11	8.5	12
29	18	22	18	18	....	29	48	28	16	12	9.2	13
30	17	19	21	40	....	29	36	22	19	12	9.0	12
31	17	....	17	64	....	24	....	19	....	12	9.0	....

NOTE.—Discharge determined as follows: Oct. 1 to Nov. 30 from one fairly well defined curve; Dec. 16 to Apr. 20, from another fairly well defined curve; indirect methods for shifting channels used Dec. 1 to 15 and Apr. 21 to Sept. 30. Discharge estimated for days in January and February on which gage heights were affected by small ice jams.

Monthly discharge of Cedar Creek near Roseworth, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	19	16	17.8	1,090	B.
November	22	16	18.4	1,090	B.
December	28	16	20.0	1,230	B.
January	64	17	19.6	1,210	B.
February	48	14	20.4	1,130	B.
March	82	14	38.2	2,350	B.
April	58	24	36.7	2,180	B.
May	48	19	32.9	2,020	B.
June	31	10	19.7	1,170	B.
July	19	10	11.8	726	B.
August	13	8	10.6	652	B.
September	13	9.2	11.2	666	B.
The year	82	8	21.5	15,500	

BIG WOOD RIVER NEAR BELLEVUE, IDAHO.

Location.—In sec. 20, T. 1 S., R. 18 E. Boise meridian, three-fourths of a mile below Blair's ranch, about 1¼ miles above the flow line of the Magic Dam reservoir and 10 miles southwest of Bellevue post office. Malad River enters the reservoir between this station and the dam.

Records available.—July 6 to November 14, 1911.

Drainage area.—Not measured.

Gage.—Lallie automatic gage set by a vertical staff outside on the right bank.

Channel.—Coarse gravel; drift collects below the station.

Discharge measurements.—Made from a cable about 30 feet above gage.

Diversions.—Considerable water used for irrigation in valleys above station. Flood waters are stored in the Idaho Irrigation Co.'s reservoir formed by the Magic dam, about 9 miles below.

Accuracy.—Data for 1911 are based entirely on measurements furnished by the Idaho Irrigation Co.

Cooperation.—Records have been compiled entirely from gage heights and discharge measurements collected and furnished by the Idaho Irrigation Co.

Discharge measurements of Big Wood River near Bellevue, Idaho, in 1911.

[Hydrographers of Idaho Irrigation Co.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
July 6	4.18	1,730	July 17	3.44	1,090	Aug. 5	1.58	263
7	4.31	1,770	19	3.22	937	8	1.42	238
8	4.24	1,750	20	3.04	861	15	1.15	149
10	3.84	1,370	22	2.94	815	22	1.07	133
11	3.73	1,290	24	2.71	715	26	1.02	120
12	3.63	1,210	27	2.43	570	Sept. 5	.93	104
15	3.55	1,160	Aug. 1	1.88	331	19	1.22	167

Daily gage height, in feet, and discharge, in second-feet, of Big Wood River near Bellevue, Idaho, for 1911.

Day.	July.		August.		September.		October.		November.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	......	......	1.87	352	0.99	116	1.21	162	1.22	165
2	......	......	1.83	338	.99	116	1.23	167	1.22	165
3	......	......	1.71	298	.96	111	1.24	169	1.22	165
4	......	......	1.65	280	.93	105	1.23	167	1.22	165
5	......	......	1.56	252	.93	105	1.23	167	1.22	165
6	4.18	1,640	1.52	241	.90	100	1.23	167	1.22	165
7	4.31	1,750	1.49	232	.88	97	1.21	162	1.23	167
8	4.24	1,690	1.42	213	.90	100	1.21	162	1.26	174
9	......	1,540	1.39	206	.94	107	1.21	162	1.26	174
10	3.84	1,380	1.35	196	.95	109	1.26	174	1.26	174
11	3.73	1,300	1.27	176	.97	113	1.34	193	1.25	172
12	3.63	1,230	......	169	.98	114	1.33	190	1.20	160
13	......	1,210	......	162	......	118	1.32	188	1.20	160
14	......	1,190	......	155	......	122	1.29	181	1.21	162
15	3.55	1,170	1.15	149	......	126	1.27	176	......	......
16	......	1,140	1.15	149	1.06	130	1.26	174	......	......
17	3.44	1,100	1.15	149	1.09	136	1.26	174	......	......
18	......	1,030	1.15	149	1.13	145	1.26	174	......	......
19	3.22	969	1.15	149	1.21	162	1.25	172	......	......
20	3.04	869	......	143	1.20	160	1.23	167	......	......
21	......	843	......	137	1.20	160	......	168	......	......
22	2.94	817	1.07	132	1.20	160	......	169	......	......
23	......	760	1.05	128	1.18	156	......	170	......	......
24	2.71	703	1.05	128	1.20	160	1.25	172	......	......
25	......	660	1.03	124	1.19	158	......	172	......	......
26	......	617	1.00	118	1.18	156	......	172	......	......
27	2.43	575	1.00	118	1.18	156	1.25	172	......	......
28	......	530	.99	116	1.20	160	......	170	......	......
29	......	485	.94	107	1.20	160	......	168	......	......
30	......	441	.96	111	1.19	158	......	166	......	......
31	......	397	1.00	118	......	......	1.22	165	......	......

NOTE.—Discharge determined from a rating curve based on discharge measurements furnished by the Idaho Irrigation Co., and well defined below 1,500 second-feet. Discharge interpolated for days for which gage heights are missing.

Monthly discharge of Big Wood River near Bellevue, Idaho, for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
July 6–31	1,750	397	1,000	51,600
August	352	107	177	10,900
September	162	97	133	7,910
October	193	162	171	10,500
November 1–14	174	160	167	4,640

BIG WOOD RIVER BELOW MAGIC DAM, NEAR RICHFIELD, IDAHO.

Location.—In sec. 18, T. 2 S., R. 18 E. Boise meridian, about one-half mile below the Magic dam of the Idaho Irrigation Co. and about 20 miles northwest of Richfield. No tributaries between the dam and the station.

Records available.—April 19 to November 21, 1911.

Drainage area.—Not measured.

Gage.—Lallie automatic gage on right bank set each week by a vertical staff outside.

Channel.—Large clean gravel; probably permanent.

Discharge measurements.—Made from a cable.

Diversions.—The Richfield diversion dam diverts part of the flow of the river about 2 miles below. The remainder of the water goes on down to the North Gooding diversion and to supply prior rights down the river.

Accuracy.—Rating curve well defined; records should be reliable.

Cooperation.—Gage heights and measurements are furnished by the Idaho Irrigation Co.

Discharge measurements of Big Wood River below Magic dam, near Richfield, Idaho, in 1911.

[Hydrographers of Idaho Irrigation Co.]

Date.	Gage. height.	Dis-charge.	Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Apr. 6	2.45	324	May 31	6.68	2,600	July 8	4.72	1,400
6	2.71	454	June 1	6.36	2,400	10	4.72	1,440
7	2.47	318	2	7.26	3,090	12	4.59	1,380
8	2.48	337	3	7.62	3,300	15	4.57	1,360
10	2.35	279	5	7.47	3,400	18	4.56	1,360
12	2.50	305	7	7.46	3,300	20	4.56	1,360
12	1.10	20.9	8	7.57	3,400	21	4.56	1,300
15	2.28	246	10	7.57	3,290	22	4.56	1,290
16	2.28	257	12	7.34	3,270	25	4.55	1,260
17	1.28	31.6	14	8.18	3,730	26	4.55	1,280
21	2.37	299	18	8.52	4,130	29	4.57	1,270
24	2.40	313	19	9.37	4,930	Aug. 2	4.52	1,260
26	1.39	46.3	20	9.02	4,610	10	4.46	1,270
27	2.48	360	21	8.80	4,390	14	4.31	1,090
May 6	1.45	55.7	23	8.30	4,030	18	4.20	1,030
8	2.45	298	24	8.06	3,680	19	4.46	1,240
11	4.25	1,330	26	7.30	3,150	24	4.11	954
12	4.78	1,600	27	7.25	3,130	28	4.09	927
17	6.22	2,620	28	7.25	3,180	30	4.01	881
19	7.93	4,070	29	7.25	3,130	Sept. 12	3.96	805
23	5.59	2,270	July 2	7.20	3,130	13	3.88	777
24	5.82	2,250	3	5.70	2,040	15	3.78	701
25	5.89	2,400	5	4.94	1,590	22	3.67	634
27	5.94	2,220	7	4.82	1,490			
29	6,36	2,070	7	4.72	1,420			

Daily gage height, in feet, of Big Wood River below Magic dam, near Richfield, Idaho, for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	....	2.51	6.4	7.2	4.55	4.01	3.55	5.1
2	....	2.52	6.9	6.9	4.5	4.01	3.55	4.95
3	....	2.53	7.3	5.55	4.5	4.00	3.55	4.8
4	....	2.52	7.5	4.95	4.50	4.00	3.55	4.42
5	....	2.50	7.5	4.95	4.5	4.00	3.60	4.06
6	....	2.25	7.5	4.95	4.49	3.99	3.91	3.25
7	....	2.43	7.5	4.8	4.48	3.99	4.00	2.89
8	....	2.45	7.5	4.7	4.47	3.98	4.23	2.85
9	....	2.67	7.7	4.7	4.47	3.97	4.6	2.86
10	....	3.67	7.6	4.7	4.46	3.96	4.75	2.86
11	....	4.13	7.4	4.7	4.45	3.96	4.7	2.80
12	....	4.65	7.4	4.65	4.40	3.96	4.7	2.73
13	....	4.95	7.7	4.6	4.32	3.93	4.7	2.78
14	....	5.0	8.2	4.55	4.32	3.85	4.65	2.78
15	....	5.25	8.5	4.55	4.31	3.78	4.65	2.81
16	....	5.3	8.7	4.55	4.30	3.78	4.6	2.86
17	....	6.6	8.6	4.55	4.26	3.77	4.08	2.86
18	....	9.2	7.7	4.55	4.20	3.77	3.81	2.83
19	2.28	7.8	9.2	4.55	4.20	3.77	3.81	2.82
20	2.32	....	9.0	4.55	4.20	3.77	3.80	2.83
21	2.30	4.7	8.8	4.55	4.19	3.72	3.80	2.84
22	2.38	5.1	8.6	4.55	4.17	3.67	3.79	....
23	2.39	5.5	8.4	4.55	4.11	3.66	3.78	....
24	2.40	5.8	8.1	4.55	4.11	3.66	3.76	....
25	2.40	6.0	7.7	4.55	4.10	3.66	3.75	....
26	2.30	5.95	7.3	4.55	4.10	3.66	3.75	....
27	2.48	6.0	7.2	4.55	4.10	3.66	4.6	....
28	2.48	6.25	7.2	4.55	4.07	3.66	5.6	....
29	2.49	6.2	7.2	4.55	4.01	3.61	5.5	....
30	2.50	6.05	7.2	4.55	4.01	3.54	5.35	....
31	....	6.45	....	4.55	4.01	....	4.9	....

Daily discharge, in second-feet, of Big Wood River below Magic dam, near Richfield, Idaho, for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	....	346	2,490	3,100	1,300	843	543	1,750
2	....	350	2,860	2,860	1,250	843	543	1,650
3	....	353	3,180	1,920	1,250	835	543	1,550
4	....	350	3,340	1,570	1,250	835	543	1,180
5	....	342	3,340	1,570	1,250	835	571	881
6	....	254	3,340	1,570	1,240	828	770	393
7	....	317	3,340	1,490	1,230	828	835	259
8	....	324	3,340	1,430	1,220	821	1,020	246
9	....	408	3,500	1,430	1,220	813	1,340	250
10	....	911	3,420	1,430	1,210	806	1,490	250
11	....	1,190	3,260	1,430	1,200	806	1,440	231
12	....	1,530	3,260	1,410	1,160	806	1,440	211
13	....	1,730	3,500	1,380	1,090	785	1,440	225
14	....	1,770	3,920	1,360	1,090	729	1,390	225
15	....	1,950	4,170	1,360	1,080	682	1,390	234
16	....	1,980	4,340	1,360	1,070	682	1,340	250
17	....	2,980	4,250	1,360	1,040	676	896	250
18	....	5,070	3,500	1,360	991	676	702	240
19	264	3,930	4,760	1,360	991	676	702	237
20	278	2,740	4,590	1,360	991	676	695	240
21	271	1,560	4,420	1,300	983	644	695	243
22	299	1,840	4,250	1,300	967	613	689	....
23	302	2,130	4,090	1,300	919	607	682	....
24	306	2,360	3,830	1,300	919	607	669	....
25	306	2,510	3,500	1,300	911	607	663	....
26	271	2,320	3,180	1,300	911	607	663	....
27	335	2,210	3,100	1,300	911	607	1,340	....
28	335	2,390	3,100	1,300	888	607	2,100	....
29	338	2,350	3,100	1,300	843	577	2,000	....
30	342	2,250	3,100	1,300	843	537	1,900	....
31	....	2,530	....	1,300	843	....	1,600	....

NOTE.—Discharge determined from rating curves based on measurements furnished by the Idaho Irrigation Co. The curves are well defined and applicable as follows: Apr. 6 to May 25; May 27 to July 20; and July 21 to Oct. 27; and Nov. 4 to 21. Shifting-channel methods used May 26 and Oct. 28 to Nov. 3.

Monthly discharge of Big Wood River below Magic dam, near Richfield, Idaho, for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
April 19-30	342	264	304	7,240
May	5,070	254	1,720	106,000
June	4,760	2,490	3,580	213,000
July	3,100	1,300	1,500	92,200
August	1,300	843	1,070	65,800
September	843	537	716	42,600
October	2,100	543	1,050	64,600
November 1-21	1,750	211	524	21,800
The period				613,000

BIG WOOD RIVER BELOW NORTH GOODING DIVERSION, NEAR SHOSHONE, IDAHO.

Location.—In sec. 15, T. 4 S., R. 18 E., about 300 yards below the heading of the North Gooding canal and about 13 miles northeast of Shoshone.

Records available.—January 1 to October 31, 1911.

Gage.—Vertical staff on left bank.

Channel.—Lava rock and very rough; permanent.

Discharge measurements.—Made by wading or from a cable.

Diversions.—Below all diversions of the Idaho Irrigation Co.

Cooperation.—Gage heights and measurements are furnished by the Idaho Irrigation Co.

Discharge measurements of Big Wood River below North Gooding diversion, near Shoshone, Idaho, in 1911.

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Apr. 6	9.10	157	July 7	10.96	635	July 21	9.57	296
11	8.21	120	7	11.06	673	22	9.60	299
14	8.15	97.9	8	10.78	580	24	9.50	281
18	7.50	32.2	11	10.54	499	25	9.36	250
21	8.12	77.3	13	10.00	350	26	9.35	250
24	8.28	98.0	14	9.93	383	27	9.41	257
25	8.25	96.2	15	10.00	376	28	9.42	271
28	8.44	113	17	9.38	247	29	9.48	279
May 12	11.94	1,200	18	9.40	270			
20	(a)	398	19	9.47	285			

a No gage height reported for this measurement.

Daily gage height, in feet, of Big Wood River below North Gooding diversion, near Shoshone, Idaho, for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	7.46	9.16	8.96	7.87	8.51	13.00	13.00	9.54	10.08	8.24
2	7.20	8.98	7.86	8.00	8.52	12.92	13.00	9.55	9.26	8.25
3	7.28	7.92	7.54	8.94	8.30	13.50	11.80	9.55	9.25	8.23
4	7.54	8.04	6.58	6.58	8.14	13.75	10.90	9.56	9.24	8.22
5	7.44	7.48	5.92	9.20	8.10	13.60	10.90	9.56	9.22	8.22
6	7.96	7.08	5.80	9.14	7.88	13.60	10.80	9.57	9.21	8.30
7	7.90	6.86	6.26	8.65	6.53	13.60	10.75	9.58	9.20	9.34
8	7.96	6.54	7.08	8.68	7.43	13.60	10.76	9.84	9.18	10.08
9	7.94	5.96	8.00	8.70	7.44	13.90	10.78	9.82	9.17	10.56
10	8.06	4.48	7.50	8.75	10.08	13.95	10.68	9.82	9.17	11.40
11	7.96	4.02	7.70	8.20	11.00	13.70	10.54	9.81	9.24	11.38
12	7.92	3.08	8.15	8.25	11.95	13.60	10.38	9.80	9.22	11.40
13	7.90	2.06	7.90	8.10	12.25	13.80	10.00	9.37	9.25	11.38
14	7.90	1.22	7.60	8.15	12.37	14.10	10.00	9.35	8.95	11.85
15	7.94	7.96	7.70	7.88	12.40	14.40	10.00	9.33	9.55	11.29
16	7.92	7.82	12.00	7.85	12.85	14.70	9.70	9.34	8.47	11.25
17	8.02	7.64	8.10	7.86	12.95	14.80	9.39	9.34	8.46	11.29
18	7.86	7.72	8.15	6.90	15.00	13.75	9.40	8.75	8.43	9.40
19	7.68	7.40	8.15	7.87	14.40	14.20	9.46	9.25	8.41	9.35
20	7.82	7.52	12.05	7.95	....	14.55	9.50	9.27	8.44	9.32
21	7.24	6.44	8.60	8.12	11.70	14.50	9.55	9.25	8.43	9.30
22	8.24	6.08	8.30	8.15	12.00	14.20	9.60	9.25	8.18	9.27
23	7.70	6.46	8.15	8.20	12.25	14.20	9.50	9.05	8.10	9.24
24	7.62	6.70	8.05	8.25	12.47	13.95	9.51	8.95	8.10	9.22
25	7.74	6.90	8.00	8.28	12.52	13.60	9.38	8.94	8.10	9.19
26	7.78	12.50	7.40	8.30	12.60	13.25	9.35	8.94	8.15	9.16
27	7.70	11.30	6.70	8.44	12.65	13.05	9.40	8.90	8.13	9.22
28	7.68	11.00	6.70	8.44	12.60	13.05	9.39	8.87	8.45	12.50
29	7.72	....	8.10	8.49	12.75	13.05	9.47	8.75	8.45	12.40
30	7.88	....	8.25	8.08	12.60	13.05	9.52	8.50	8.28	12.30
31	8.54	....	7.95	....	12.60	....	9.52	8.45	....	12.10

Daily discharge, in second-feet, of Big Wood River below North Gooding diversion, near Shoshone, Idaho, for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	34	222	191	63	129	1,650	1,650	287	398	98
2	20	194	62	74	131	1,600	1,650	289	238	100
3	24	67	38	188	105	2,000	966	289	236	97
4	38	78	3.8	3.8	88	2,180	617	291	235	96
5	32	35	0	228	84	2,070	617	291	231	96
6	70	15	0	218	63	2,070	586	293	230	105
7	65	9.2	.6	148	3.3	2,070	571	294	228	252
8	70	3.4	15	151	32	2,070	574	345	225	398
9	69	0	74	154	32	2,300	580	341	223	516
10	80	0	36	161	398	2,330	550	341	223	796
11	70	0	49	94	650	2,150	511	339	235	788
12	67	0	89	100	1,040	2,070	469	337	231	796
13	65	0	65	84	1,190	2,220	380	257	236	788
14	65	0	42	89	1,260	2,450	380	254	190	989
15	69	70	49	63	1,270	2,680	380	250	280	753
16	67	59	1,060	61	1,550	2,920	317	252	124	738
17	76	45	84	62	1,620	3,010	260	252	123	753
18	62	51	89	10	3,180	2,180	262	161	120	262
19	48	30	89	63	2,680	2,520	273	236	117	254
20	59	37	1,080	70	1,800	2,800	280	240	121	248
21	22	2.4	141	86	921	2,760	289	236	120	245
22	98	0	105	89	1,060	2,520	298	236	92	240
23	49	2.6	89	94	1,190	2,520	280	204	84	235
24	43	6	79	100	1,310	2,330	282	190	84	231
25	52	10	74	103	1,340	2,070	259	188	84	226
26	55	1,330	30	105	1,390	1,820	254	188	89	222
27	49	757	6	121	1,420	1,680	262	182	87	231
28	48	650	6	121	1,390	1,680	260	178	122	1,330
29	51	....	84	127	1,480	1,680	275	161	122	1,270
30	63	....	100	82	1,390	1,680	284	128	103	1,220
31	133	....	70	....	1,390	....	284	122	....	1,110

NOTE.—Discharge determined from a rating curve based on measurements furnished by the Idaho Irrigation Co. and well defined except at extreme high stages.

Monthly discharge of Big Wood River below North Gooding diversion, near Shoshone, Idaho, for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	133	20	58.5	3,600	C.
February	1,330	0	131	7,280	C.
March	1,080	0	126	7,750	B.
April	228	3.8	104	6,190	A.
May	3,180	3.3	1,020	62,700	B.
June	3,010	1,600	2,200	131,000	B.
July	1,650	254	481	29,600	A.
August	345	122	247	15,200	A.
September	398	84	175	10,400	A.
October	1,330	96	499	30,700	A.
The period	....	....	....	304,000	

BIG WOOD RIVER NEAR SHOSHONE, IDAHO.

Location.—In sec. 17, T. 5 S., R. 17 E. Boise meridian, at a private wagon bridge at A. D. Silva's ranch, 1 mile below the steel wagon bridge and 7 miles northwest of Shoshone; 24 miles below Magic dam. No tributaries between this station and the one below North Gooding diversion.

Records available.—June 5, 1905, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on right bank about 10 feet below the private bridge built in the fall of 1910.

Channel.—Smooth and permanent, except for temporary obstructions in May and June, 1911.

Discharge measurements.—Made from a cable about 100 yards above gage.

Diversions.—No important diversions between the North Gooding station and the ditch at Silva's ranch; ranch ditches divert below.

Accuracy.—Results are reliable except for May and June, 1911. Accuracy of records for periods during which ice was present somewhat approximate. Records for period during and since the construction of Magic dam may contain errors, due to the artificial control.

Discharge measurements of Big Wood River near Shoshone, Idaho, for the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 28	A. B. Purton	6.23	1,410	June 29	H. L. Stoner	6.50	1,960
June 10	H. L. Stoner	7.10	2,400	July 8	.....do	4.15	482
10	.....do	7.07	2,060	18	G. C. Baldwin	3.28	213
11	.....do	6.95	1,900	Sept. 30	H. L. Stoner	2.65	72.2

Daily gage height, in feet, of Big Wood River near Shoshone, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.5	2.4	2.5	2.40	4.00	3.00	2.80	3.00	6.50	6.50	3.40	3.50
2	2.6	2.35	2.5	2.30	3.80	2.70	2.80	3.00	6.40	6.50	3.40	3.50
3	2.4	2.3	2.5	2.30	2.60	2.40	3.30	3.00	6.85	5.50	3.40	3.25
4	2.45	2.25	2.55	2.30	2.60	2.60	2.80	2.80	7.00	4.65	3.40	3.20
5	2.55	2.25	2.55	2.40	2.55	3.30	2.70	2.75	7.00	4.50	3.40	3.20
6	2.7	2.25	2.6	2.40	2.50	3.65	3.40	2.70	7.00	4.45	3.40	3.20
7	2.7	2.2	2.65	2.50	2.50	3.40	3.00	2.60	7.00	4.40	3.60	3.20
8	2.7	2.2	2.7	2.50	2.40	3.15	3.00	2.50	7.00	4.25	3.60	3.20
9	2.7	2.1	2.75	2.50	2.30	4.50	2.90	2.40	7.10	4.15	3.55	3.20
10	2.65	2.1	2.8	2.50	....	2.80	2.90	3.00	7.10	4.10	3.50	3.25
11	2.6	2.1	2.9	2.60	....	2.70	2.80	4.60	6.95	3.95	3.60	3.25
12	2.55	2.2	2.9	2.65	....	2.70	2.80	5.00	6.90	3.85	3.60	3.30
13	2.5	2.2	2.85	2.65	....	2.70	2.80	5.40	6.90	3.65	3.40	3.30
14	2.5	2.45	2.85	2.60	....	2.70	2.80	5.60	7.10	3.65	3.35	3.30
15	2.5	2.45	2.85	2.60	....	2.40	2.80	5.60	7.40	3.50	3.35	3.25
16	2.5	2.45	2.7	2.60	....	5.00	2.50	6.00	7.50	3.30	3.30	3.20
17	2.55	2.4	2.5	2.60	....	2.70	2.50	6.40	7.50	3.30	3.30	3.15
18	2.55	2.4	2.5	2.60	....	2.80	2.50	8.00	6.90	3.30	3.10	3.05
19	2.6	2.4	2.5	2.60	....	3.00	2.50	7.60	7.30	3.30	3.20	3.00
20	2.6	2.4	2.5	2.60	....	5.50	2.50	4.50	7.85	3.35	3.20	2.90
21	2.6	2.4	2.5	2.60	....	3.55	2.50	4.80	7.65	3.35	3.15	2.90
22	2.6	2.45	2.5	2.50	....	3.50	2.50	5.40	7.50	3.40	3.20	2.80
23	2.6	2.45	2.5	2.50	....	3.40	2.45	5.70	7.30	3.40	3.20	2.80
24	2.6	2.5	2.7	2.60	....	3.10	2.40	5.90	7.20	3.40	3.20	2.70
25	2.6	2.5	2.7	2.80	....	2.80	2.35	6.05	7.00	3.30	3.20	2.70
26	2.6	2.5	2.5	2.90	....	2.40	2.30	6.10	6.65	3.30	3.20	2.70
27	2.6	2.5	2.5	2.70	6.00	2.20	2.30	6.10	6.50	3.30	3.20	2.80
28	2.6	2.5	2.5	2.60	5.40	1.90	2.80	6.20	6.50	3.30	3.10	2.80
29	2.4	2.5	2.5	2.60	....	3.00	2.80	6.30	6.50	3.30	3.10	2.80
30	2.4	2.5	2.4	3.60	....	3.30	2.80	6.20	6.50	3.30	3.00	2.80
31	2.4	....	2.4	4.80	....	2.80	....	6.10	....	3.40	3.00	....

NOTE.—Gage heights affected by ice Dec. 21 to Feb. 9; water standing in pools under ice Feb. 10 to 25.

Daily discharge, in second-feet, of Big Wood River near Shoshone, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	55	43	55	....	141	100	141	1,590	1,870	243	271
2	69	38	55	....	83	100	141	1,520	1,870	243	271
3	43	33	55	....	43	216	141	1,860	1,180	243	203
4	49	29	62	....	68	100	100	1,980	710	243	190
5	62	29	62	....	216	83	92	1,980	640	243	190
6	85	29	69	....	317	243	83	1,980	618	243	190
7	85	25	77	....	243	141	68	1,980	595	301	190
8	85	25	85	....	178	141	55	1,980	532	301	190
9	85	17	94	....	640	119	43	2,220	492	286	190
10	77	17	103	0	100	119	141	2,220	472	271	203
11	69	17	123	0	83	100	685	1,940	418	301	203
12	62	25	123	0	83	100	890	1,900	383	301	216
13	55	25	113	0	83	100	1,120	2,060	317	243	216
14	55	49	113	0	83	100	1,240	2,380	317	230	216
15	55	49	113	0	43	100	1,240	2,670	271	230	203
16	55	49	85	0	890	55	1,450	2,770	216	216	190
17	62	43	55	0	83	55	1,690	2,770	216	216	178
18	62	43	55	0	100	55	3,070	2,200	216	165	153
19	69	43	55	0	141	55	2,580	2,570	216	190	141
20	69	43	55	0	1,180	55	490	3,140	230	190	119
21	69	43	....	0	286	55	605	2,920	230	178	119
22	69	49	....	0	271	55	895	2,770	243	190	100
23	69	49	....	0	243	49	1,060	2,570	243	190	100
24	69	55	....	0	165	43	1,180	2,470	243	190	83
25	69	55	....	0	100	38	1,280	2,290	216	190	83
26	69	55	....	400	43	33	1,320	1,990	216	190	83
27	69	55	....	1,500	25	33	1,320	1,870	216	190	100
28	69	55	....	1,120	7	100	1,380	1,870	216	165	100
29	43	55	....	....	141	100	1,450	1,870	216	165	100
30	43	55	....	....	216	100	1,380	1,870	216	141	100
31	43	....	....	....	100	....	1,320	....	243	141	....

NOTE.—Discharge determined as follows: Oct. 1 to Dec. 20, Feb. 27 to May 15, and June 14 to Sept. 30, from a rating curve well defined above 20 second-feet; May 20 to June 12, from a rating curve well defined between 1,000 and 1,500 second-feet. Unstable conditions apparently existed May 20 to June 12, and the accuracy for those months has been reduced. Mean discharge Dec. 21 to 31 estimated at 45 second-feet; January, 50 second-feet; Feb. 1 to 9, 60 second-feet; Feb. 26, 400 second-feet. Shifting-channel methods used May 16 to 19, and June 13; discharge June 9 to 10 estimated from measurements.

Monthly discharge of Big Wood River near Shoshone, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	85	43	64.2	3,950	A.
November	85	17	39.9	2,370	A.
December	123	....	67.8	4,170	C.
January	....	....	50	3,070	D.
February	1,500	0	127	7,050	D.
March	1,180	7	206	12,700	B
April	243	33	91.4	5,440	A.
May	3,070	43	924	56,800	B.
June	3,140	1,520	2,210	132,000	B.
July	1,870	216	461	28,300	A.
August	301	141	220	13,500	A.
September	271	83	163	9,700	A.
The year	3,140	0	385	279,000	

MALAD RIVER NEAR BLAINE, IDAHO.[1]

Location.—In sec. 15, T. 1 S., R. 16 E., Boise meridian, just below a sheep bridge which is about 2½ miles above the flow line of the Magic dam reservoir and 1½ miles below the Central Idaho Railroad bridge. No tributaries between station and reservoir.

Records available.—Discharge measurements in 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on left bank. June 9–21 staff gage bearing no determined relation to later gages. June 23 high-water staff gage 80 feet upstream from later permanent gage, with datum 1.95 higher than permanent gage as determined by levels in 1912.

Channel.—Rough, rocky, and should be permanent.

Discharge measurements.—Made by wading or, when necessary, from the sheep bridge above the gage.

Diversions.—No diversions between station and reservoir.

Cooperation.—List of measurements furnished by Idaho Irrigation Co.

Discharge measurements of Malad River near Blaine, Idaho, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
June 9[a]	Idaho Irrigation Co....	2.40	533	July 20	Idaho Irrigation Co....	1.63	27.4
13[a]	.....do................	2.10	432	21	.....do................	1.53	21.6
16[a]	.....do................	2.18	435	22	.....do................	1.50	20.2
21[a]	.....do................	1.75	366	24	.....do................	1.42	17.3
23[b]	.....do................	2.11	273	27	.....do................	1.40	17.4
26	.....do................	1.87	185	31	.....do................	1.27	8.2
28	.....do................	2.70	158	Aug. 3	.....do................	1.25	6.5
30	.....do................	2.88	181	9	.....do................	1.15	5.6
July 6	.....do................	2.32	96.4	14[c]	.....do................	1.12	7.4
10	.....do................	2.04	55.1	14	.....do................	1.12	4.9
11	.....do................	1.98	56.0	18[c]	.....do................	1.02	5.2
12	.....do................	1.93	54.6	26[c]	.....do................	1.05	6.6
15	.....do................	1.72	33.6	Oct. 25	.....do................	1.35	17.5
17	.....do................	1.68	30.4				

[a] Gage heights bear no known relation to those of later measurements.
[b] Referred to a high-water gage 80 feet upstream from permanent gage and at datum 1.95 feet higher.
[c] Made by wading 300 feet below the regular section.

LITTLE WOOD RIVER NEAR RICHFIELD, IDAHO.

Location.—In sec. 30, T. 4 S., R. 20 E. Boise meridian, about 1 mile east of the Richfield depot and half a mile above the heading of the Dietrich canal.

Records available.—January 1 to October 9, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on right bank.

Channel.—Large gravel and rock; some weeds; control probably permanent.

Discharge measurements.—Made by wading or from a suspension foot bridge.

Diversions.—Two canals divert water a short distance below the station.

Cooperation.—Gage heights and discharge measurements furnished by the Idaho Irrigation Co.

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[1] Formerly known as Camas Creek.

Discharge measurements of Little Wood River near Richfield, Idaho, in 1911.

[Hydrographers of Idaho Irrigation Co.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Mar. 13	2.65	174	May 20	4.23	595	June 30	3.04	230
14	2.57	156	20	4.17	576	July 1	3.00	215
16	2.60	160	21	4.06	539	1	2.99	212
17	2.60	169	22	3.99	520	3	2.83	179
18	2.62	158	30	3.93	518	5	2.65	140
21	2.91	169	31	3.85	500	6	2.63	140
22	2.98	202	June 1	3.83	468	7	2.61	137
23	3.00	202	2	4.05	566	10	2.60	129
24	3.12	249	3	4.18	546	11	2.46	102
25	3.20	257	5	4.35	635	12	2.41	94.2
28	2.91	190	6	4.37	639	13	2.37	83.3
Apr. 5	3.82	427	23	3.75	448	13	2.35	84.3
6	3.67	389	24	3.70	431	14	2.28	71.9
7	3.54	350	26	3.43	328	15	2.21	64.3
14	3.37	310	26	3.38	314	17	2.20	62.5
May 18	4.40	688	27	3.27	280			
19	4.40	679	28	3.13	243			

Daily gage height, in feet, of Little Wood River near Richfield, Idaho, for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	2.48	3.7		3.35	4.1	3.85	3.00	2.19	2.64	
2		3.75		3.65	4.1	4.0	2.99	2.22	2.61	2.79
3	2.74	3.25		3.85	4.0	4.2	2.85	2.21		2.79
4	2.70	2.64		3.8	4.0	4.3	2.72	2.29	2.64	2.82
5	2.55	3.75		3.8	4.0	4.3	2.65	2.34	2.63	2.83
6	2.87	3.25		3.65	4.0	4.4	2.63		2.63	2.82
7	2.90	2.91		3.55	4.2	4.3	2.61	2.40	2.68	2.82
8	2.91			3.45	4.2	4.2	2.64	2.42	2.70	
9	2.91			3.45	4.1	4.4	2.61	2.45	2.70	2.82
10	2.85		2.60	3.5	4.0	4.3	2.60	2.45		
11	2.90		2.60	3.6	4.0	4.0	2.48	2.46	2.70	
12	2.84		2.65	3.55	3.85	4.1	2.41	2.46	2.71	
13	2.96		2.65	3.45	3.8	4.2	2.37		2.71	
14	2.97		2.57	3.35	3.75	4.2	2.29	2.47	2.72	
15	3.0			3.3	3.75	4.3	2.21	2.45	2.74	
16	2.9		2.60	3.2	4.0	4.3	2.20	2.43	2.75	
17	2.68		2.60	3.2	4.5	4.3	2.20			
18	2.75		2.62	3.3	4.5	4.2	2.25	2.42	2.75	
19	2.89		2.65	3.35	4.4	4.1	2.25	2.42	2.77	
20	3.0		2.70	3.45	4.2	4.0	2.22		2.78	
21	3.05		2.91	3.45	4.1	3.95	2.19	2.46	2.79	
22	2.63		2.98	3.35	4.0	3.9	2.21	2.45	2.76	
23	2.7		3.0	3.35	4.0	3.8	2.21	2.45	2.76	
24			3.1	3.45	4.1	3.7	2.22	2.45	2.76	
25	3.75		3.2	3.5	4.1	3.55	2.16	2.49	2.76	
26	3.45		3.05	3.6	4.2	3.45	2.20	2.52	2.76	
27			2.95	3.9	4.2	3.4	2.22		2.77	
28			2.91	4.1	4.1	3.25	2.20	2.55	2.77	
29			2.9	4.2	4.1	3.15	2.21	2.58	2.77	
30	3.7		2.92	4.0	3.95	3.05	2.22	2.59	2.79	
31			3.0		3.85		2.21	2.58		

NOTE.—River reported full of ice Feb. 8 to Mar. 9 and no gage heights reported. Gage heights probably affected by ice Jan. 1 to Feb. 7.

Daily discharge, in second-feet, of Little Wood River near Richfield, Idaho, for 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	....	303	560	469	210	63	135	164
2	....	399	560	523	208	67	129	164
3	....	469	523	598	176	65	132	164
4	....	451	523	638	150	77	135	170
5	....	451	523	638	136	84	133	172
6	....	399	523	680	133	88	133	170
7	....	366	598	638	129	93	142	170
8	....	334	598	598	135	96	146	170
9	....	334	560	680	129	101	146	170
10	161	350	523	638	127	101	146	....
11	161	382	523	523	106	103	146	....
12	172	366	469	560	95	103	148	....
13	172	334	451	598	88	104	148	....
14	155	303	434	598	77	104	150	....
15	158	288	434	638	65	101	154	....
16	161	260	523	638	64	98	156	....
17	161	260	722	638	64	97	156	....
18	165	288	722	598	71	96	156	....
19	160	303	680	560	71	96	160	....
20	160	334	598	523	67	100	162	....
21	189	334	560	505	63	103	164	....
22	205	303	523	487	65	101	158	....
23	210	303	523	451	65	101	158	....
24	234	334	560	416	67	101	158	....
25	260	350	560	366	59	107	158	....
26	222	382	598	334	64	113	158	....
27	198	487	598	318	67	116	160	....
28	189	560	560	274	64	118	160	....
29	187	598	560	247	65	123	160	....
30	192	523	505	222	67	125	164	....
31	210	....	469	....	65	123	....	....

NOTE.—Discharge determined as follows: Mar. 10 to 18, from a fairly well-defined rating curve; Mar. 19 to 20, by shifting-channel methods; Mar. 21 to Oct. 9, from a well-defined curve. Mean discharge for January estimated at 200 second-feet; for February, 180 second-feet; and Mar. 1 to 9, 160 second-feet.

Monthly discharge of Little Wood River near Richfield, Idaho, for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January	....	....	200	12,300
February	....	....	180	10,000
March	260	....	178	10,900
April	598	260	372	22,100
May	722	434	550	33,800
June	680	222	520	30,900
July	210	59	97.2	5,980
August	125	63	99.0	6,090
September	164	129	150	8,930
October 1-9	172	164	168	3,000
The period	....	....	....	144,000

LITTLE CANYON CREEK AT GLENNS FERRY, IDAHO.

Location.—In sec. 30, T. 5 S., R. 10 E. Boise meridian, at the bridge in Glenns Ferry on the road from Glenns Ferry to Hammett, about 2 miles above mouth of stream; below all tributaries.

Records available.—November 20, 1909, to April 30, 1910; November 22, 1910, to June 16, 1911.

Drainage area.—52.5 square miles.

Gage.—Vertical staff on right bank, spiked to downstream side of bridge; datum unchanged.

Channel.—Rocky and practically permanent; artificial control below affects gage heights at times.

Discharge measurements.—Made from bridge or by wading.

Diversions.—During the irrigating season water is diverted a short distance below the station, and there are numerous diversions above.

Accuracy.—The ratings are well defined for this station and the records are reliable, except for occasional uncertainties in regard to the duration and amount of artificial control at the diversion dam below.

Cooperation.—Gage heights are furnished by the Kings-Hill Extension Irrigation Co. Daily discharges for November 22 to December 31 were also furnished by the company.

Discharge measurements of Little Canyon Creek at Glenns Ferry, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
1910.			
Nov. 11	Lynn Crandall	0.35	[a] 0.6
1911.			
Feb. 24	Baldwin and Bergstrom	.80	5.0
Mar. 22	O. W. Hartwell	1.64	66.1
May 21	J. C. Dort	1.94	47.4

[a] Estimated.

Daily gage height, in feet, of Little Canyon Creek at Glenns Ferry, Idaho, for the year ending Sept. 30, 1911.

[A. W. Bergstrom, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	Day.	Jan.	Feb.	Mar.	Apr.	May.	June.
1	......	2.10	0.70	1.50	2.10	2.20	16	......	0.95	1.35	......	2.10	1.65
2	......	1.70	.67	1.53	2.10	2.20	17	......	.90	1.32	0.94	2.05	......
3	......	1.20	......	1.50	2.12	2.20	18	......	.80	1.42	.95	2.00	......
4	......	1.55	1.03	1.40	2.15	2.17	19	......	.80	1.45	.94	1.97	......
5	......	1.40	......	......	2.20	2.15	20	......	.70	1.51	......	1.95	......
6	......	1.10	1.16	1.31	2.25	2.00	21	......	.70	1.58	.98	1.97	......
7	......	.80	1.20	1.24	2.20	2.00	22	......	.70	1.60	.93	2.05	......
8	......	.70	1.15	1.20	2.15	2.10	23	......	.80	1.60	.95	2.10	......
9	......	.90	1.13	1.18	2.12	2.05	24	......	.80	1.63	.96	2.15	......
10	......	.80	1.03	1.14	2.10	1.95	25	1.35	.80	1.55	1.04	2.22	......
11	......	.90	1.25	1.12	2.08	1.70	26	1.50	.75	1.37	.80	2.30	......
12	......	.55	......	1.10	2.05	1.95	27	1.50	.72	1.35	.95	2.30	......
13	......	.90	1.11	1.05	2.08	2.05	28	.90	......	1.28	2.05	2.30	......
14	......	.60	1.14	......	2.10	2.05	29	.90	......	1.30	2.08	2.27	......
15	......	.80	1.24	.98	2.10	1.75	30	2.80	......	1.40	2.10	2.25	......
							31	3.80	......	1.45	......	2.22	......

NOTE.—No records available Nov. 22 to Jan. 24. A diversion dam below the gage affected the gage heights by variable amounts from Apr. 28 to June 16.

Daily discharge, in second-feet, of Little Canyon Creek at Glenns Ferry, Idaho, for the year ending Sept. 30, 1911.

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.
1	....	6.5	....	132	2.5	51	65	76
2	....	6.0	....	74	2.1	54	65	76
3	....	7.0	....	24	8.0	51	67	76
4	....	10.0	....	56	14	41	70	73
5	....	10.0	....	41	18	37	76	70
6	....	8.0	....	18	22	33	82	54
7	....	6.5	....	5.0	24	27	76	54
8	....	6.5	....	2.5	21	24	70	65
9	....	6.5	....	8.5	20	23	67	60
10	....	7.0	....	5.0	14	20	65	49
11	....	12.0	....	8.5	28	19	63	27
12	....	14.0	....	.8	24	18	60	49
13	....	12.0	....	8.5	19	16	63	60
14	....	10.0	....	1.2	20	14	65	60
15	....	9.0	....	5.0	27	12	65	31
16	....	8.0	....	11	36	11	65	24
17	....	7.0	....	8.5	34	10	60	....
18	....	5.0	....	5.0	43	11	54	....
19	....	5.0	....	5.0	46	10	51	....
20	....	4.0	....	2.5	52	11	49	....
21	....	4.0	....	2.5	60	12	51	....
22	8.0	4.0	....	2.5	62	9.8	60	....
23	9.0	4.0	....	5.0	62	11	65	....
24	8.0	4.0	....	5.0	66	11	70	....
25	7.0	3.0	36	5.0	56	15	78	....
26	6.5	3.0	51	3.8	38	5.0	88	....
27	6.0	3.0	51	3.0	36	11	88	....
28	6.5	3.0	8.5	2.8	30	60	88	....
29	6.0	3.0	8.5	....	32	63	84	....
30	6.0	1.5	260	....	41	65	82	....
31	....	1.5	500	....	46	....	78	....

NOTE.—Discharges for Nov. 22 to Dec. 31 were furnished by the Kings-Hill Extension Irrigation Co. Discharge for Jan. 25 to Apr. 27 determined from a well-defined rating curve. Discharges for Apr. 28 to June 16 determined from a fairly well-defined curve applicable when the temporary diversion dam below the station affected the gage heights.

Monthly discharge of Little Canyon Creek at Glenns Ferry, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
November 22-30	9.0	6.0	7.00	125	
December	14	1.5	6.26	385	
January 25-31	500	8.5	131	1,820	C.
February	132	.8	16.1	894	A.
March	66	2.1	32.4	1,990	A.
April	65	5.0	25.2	1,500	A.
May	88	49	68.7	4,220	B.
June 1-16	76	24	56.5	1,790	B.

ALKALI CREEK NEAR GLENNS FERRY, IDAHO.

Location.—In sec. 27, T. 5 S., R. 9 E. Boise meridian, where the county road from Glenns Ferry to Hammett crosses Alkali Creek, about 3 miles west of Glenns Ferry; below all tributaries.

Records available.—November 20, 1909, to April 23, 1910; December, 1910; January 25 to June 15, 1911 (gage heights and measurements only during 1911).

Drainage area.—38 square miles.

Gage.—Staff gage originally at the ford. During summer of 1910 a new bridge was built, and on January 25, 1911, a gage was spiked to the downstream side.

Channel.—Gravel; may shift; control artificial in 1911; railroad dike below.

Discharge measurements.—Made by wading, or from the bridge at flood stages.

Winter flow.—Affected by ice.

Artificial control.—During the irrigating season a large part of the flow is maintained by irregular leakage and waste from the Kings-Hill Extension Irrigation Co.'s canal which crosses the creek in a flume above the gaging station. The amount of water from the canal varies also, and the normal flow of the creek is not definitely known.

Accuracy.—Results are approximate.

Cooperation.—Gage heights have been furnished by the Kings-Hill Extension Irrigation Co. No estimates of flow have been made for 1911 because of lack of data.

Discharge measurements of Alkali Creek near Glenns Ferry, Idaho, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 24	G. C. Baldwin	(a)	[b] 1.3
Mar. 22	O. W. Hartwell	1.34	[b] 2.4
May 21	Dort and Lathrop	2.55	15.6

[a] Water below gage. [b] Estimated.

Daily gage height, in feet, of Alkali Creek near Glenns Ferry, Idaho, for 1911.

[A. W. Bergstrom, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	Day.	Jan.	Feb.	Mar.	Apr.	May.
1		1.9				16			1.39		
2		1.8				17			1.4	1.33	
3						18			1.4		
4		1.2				19			1.35		
5			1.6			20					
6			1.63			21			1.35		2.55
7			1.55			22			1.33		
8			1.6			23			1.45		
9			1.53			24			1.4		
10			1.5			25	2.65		1.43		
11			1.47			26	2.25		1.4		
12						27	2.0		1.35		
13			1.4			28	1.75		1.32		
14			1.4			29	1.85				
15			1.4			30	4.6		1.32		
						31	3.1		1.3		

NOTE.—Creek practically dry after Apr. 1 except for leakage from the company canal.

COLD SPRING CREEK NEAR HAMMETT,[1] IDAHO.

Location.—In sec. 31, T. 5 S., R. 9 E. Boise meridian, at the highway bridge on the county road from Glenns Ferry to Hammett, a short distance above the point at which the Oregon Short Line Railroad crosses the creek, about 3 miles east of Hammett and 8 miles west of Glenns Ferry; below all tributaries and diversions.

Records available.—November 20, 1909, to April 23, 1910; November 22 to December 31, 1910; January 26 to June 17, 1911.

Drainage area.—65 square miles.

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[1] Post office formerly known as Medbury.

Gage.—Vertical staff at lower side of highway bridge; destroyed April 23, 1910; reinstalled January 26, 1911, at different datum; datum constant since January 26, 1911.

Channel.—Gravel and rocky, but shifts at times.

Discharge measurements.—By wading or from the bridge.

Accuracy.—Ratings well defined and records are fairly reliable.

Cooperation.—Gage heights furnished by Kings-Hill Extension Irrigation Co. Daily discharges for November 22 to December 31, 1910, were also furnished by the company.

Discharge measurements of Cold Spring Creek near Hammett, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 24	G. C. Baldwin	2.1	[a] 4.2
Mar. 22	O. W. Hartwell	2.46	22.1
May 21	Dort and Lathrop	2.83	56.5

[a] Estimated.

Daily gage height, in feet, of Cold Spring Creek near Hammett, Idaho, in the year ending Sept. 30, 1911.

[A. W. Bergstrom, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	Day.	Jan.	Feb.	Mar.	Apr.	May.	June.
1	......	2.80	2.03	2.60	2.10	2.20	16	......	2.10	......	......	2.70	2.00
2	......	......	2.05	2.65	2.10	2.20	17	......	2.20	2.08	1.97	2.75	1.80
3	......	......	2.05	2.67	2.08	2.50	18	......	2.20	2.18	......	2.90	......
4	......	2.60	2.10	2.55	2.05	2.50	19	......	2.20	2.20	2.05	2.80	......
5	......	2.60	2.10	2.64	2.20	2.50	20	......	2.10	2.20	2.08	2.80	......
6	......	2.50	2.08	2.55	2.40	2.30	21	......	2.10	2.37	2.08	2.79	......
7	......	2.30	2.10	2.48	2.40	2.30	22	......	2.10	2.44	2.02	2.70	......
8	......	2.20	2.12	......	2.40	2.30	23	......	2.05	2.53	2.03	2.70	......
9	......	2.40	2.10	2.40	2.35	2.30	24	......	2.10	2.62	2.02	2.70	......
10	......	2.30	1.98	2.36	2.30	2.20	25	......	2.05	2.62	1.90	2.70	......
11	......	2.25	2.10	2.30	2.35	2.10	26	2.07	2.25	2.60	1.95	2.70	......
12	......	2.10	......	2.25	2.40	2.00	27	1.97	2.00	2.57	2.05	2.65	......
13	......	2.20	......	......	2.40	2.00	28	1.80	2.17	2.50	2.10	2.60	......
14	......	2.15	2.00	2.10	2.40	2.00	29	2.10	......	2.50	2.10	2.52	......
15	......	2.10	2.04	2.00	2.55	2.00	30	3.40	......	2.48	2.10	2.45	......
							31	4.80	.....	2.57	......	2.45	......

Daily discharge, in second-feet, of Cold Spring Creek near Hammett, Idaho, in the year ending Sept. 30, 1911.

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.
1	....	2.0	....	51	2.2	32	4.0	8
2	....	2.0	....	44	2.8	36	4.0	8
3	....	3.0	....	38	2.8	38	3.5	24
4	....	5.0	....	32	4.0	28	2.8	24
5	....	4.0	....	32	4.0	36	8.0	24
6	....	3.0	....	24	3.5	28	17	12
7	....	2.5	....	12	4.0	23	17	12
8	....	2.5	....	8	4.8	20	17	12
9	....	2.0	....	17	4.0	17	14	12
10	....	3.0	....	12	1.3	15	12	8
11	....	3.5	....	10	4.0	12	14	4
12	....	4.0	....	4	3.2	10	17	1.5
13	....	3.0	....	8	2.4	7	17	1.5
14	....	1.0	....	6	1.5	4	17	1.5
15	....	2.0	....	4	2.5	1.5	28	1.5
16	....	2.0	....	4	3.0	1.3	41	1.5
17	....	2.0	....	8	3.5	1.1	46	0
18	....	1.0	....	8	7.2	2.0	51	....
19	....	1.0	....	8	8.0	2.8	51	....
20	....	1.0	....	4	8.0	3.5	51	....
21	....	1.0	....	4	16	3.5	50	....
22	2.0	1.0	....	4	20	2.0	41	....
23	3.0	1.0	....	2.8	26	2.2	41	....
24	2.5	1.0	....	4	34	2.0	41	....
25	2.0	.5	....	2.8	34	.3	41	....
26	2.0	.5	3.2	10	32	.9	41	....
27	2.0	.5	1.1	1.5	30	2.8	36	....
28	2.0	.5	.0	6.8	24	4.0	32	....
29	2.0	.5	4.0	....	24	4.0	26	....
30	2.5	.0	126	....	23	4.0	20	....
31	....	.0	364	....	30	....	20	....

NOTE.—Discharge record Nov. 22 to Dec. 31 furnished by the Kings-Hill Extension Irrigation Co. Discharge Jan. 26 to June 17 determined from a fairly well defined rating curve.

Monthly discharge of Cold Spring Creek near Hammett, Idaho, in the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
November 22–30	3	2	2.22	39.6	
December	5	0	1.81	111	
January 26–31	364	.0	83.0	988	C.
February	51	1.5	13.2	733	A.
March	34	1.3	11.9	732	A.
April	38	.3	11.5	684	A.
May	51	2.8	26.5	1,630	A.
June 1–17	24	.0	9.15	309	A.

BENNETT CREEK NEAR HAMMETT,[1] IDAHO.

Location.—In sec. 27, T. 5 S., R. 8 E. Boise meridian, at a bridge about one-fourth mile west of the Oregon Short Line Railroad tracks and about 2 miles west of Hammett, Idaho. About 2 miles above junction with Snake River; below all tributaries.

Records available.—November 20, 1909, to April 30, 1910; November 22 to December 31, 1910; January 23 to June 21, 1911.

Drainage area.—69 square miles.

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[1] Formerly known as Medbury, Idaho.

Gage.—Vertical staff gage on downstream side of highway bridge. Change in datum after February 27, 1910. On January 23, 1911, the gage was reinstalled at a new bridge, same location as the old bridge, but the gage at a new datum.

Channel.—Gravel; shifts at times.

Discharge measurements.—Made by wading, or from the bridge.

Winter flow.—Not affected by ice to any extent.

Accuracy.—Ratings are well defined and records fairly reliable.

Cooperation.—Gage heights furnished by the Kings-Hill Extension Irrigation Co. Daily discharges for the period November 22 to December 31, 1910, have been furnished by the company.

Discharge measurements of Bennett Creek near Hammett, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 24	Baldwin and Bergstrom	9.31	9.8	Mar. 22	O. W. Hartwell	9.88	63.2
24	.....do	9.32	10.5	May 21	Dort and Lathrop	9.85	50.4

Daily gage height, in feet, of Bennett Creek near Hammett, Idaho, for the year ending Sept. 30, 1911.

[A. W. Bergstrom, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.
1	....	12.40	....	9.70	9.15	9.10
2	....	11.00	9.30	9.65	9.15	9.10
3	....	11.20	....	9.60	9.15	9.40
4	....	10.40	9.43	9.60	9.15	9.30
5	....	10.40	9.81	9.51	9.22	9.30
6	....	9.90	9.77	9.47	9.30	9.10
7	....	9.80	9.75	....	9.30	9.00
8	....	9.80	9.90	9.29	9.30	9.00
9	....	9.60	9.63	9.21	9.35	9.30
10	....	9.60	....	9.23	9.40	9.10
11	....	9.60	9.73	9.18	9.40	9.00
12	....	9.55	....	9.13	9.40	9.00
13	....	9.50	9.65	9.13	9.40	8.90
14	....	9.60	9.73	9.10	9.40	8.90
15	....	9.45	9.80	9.10	9.60	8.90
16	....	9.50	9.80	9.10	9.80	8.90
17	....	9.40	9.88	9.10	9.90	8.80
18	....	9.40	9.80	9.05	10.00	8.80
19	....	9.40	9.82	9.10	9.90	8.70
20	....	9.30	9.88	9.10	9.80	8.70
21	....	9.30	9.80	9.15	9.80	8.70
22	....	9.30	9.84	9.11	9.70	....
23	8.44	9.30	9.90	9.11	9.70	....
24	8.64	9.31	10.00	9.05	9.70	....
25	8.53	9.20	9.88	9.10	9.65	....
26	10.70	9.16	9.80	9.10	9.60	....
27	9.90	....	9.70	9.10	9.50	....
28	9.00	9.10	9.63	9.10	9.40	....
29	9.70	....	9.60	9.12	9.30	....
30	13.70	....	9.70	9.15	9.20	....
31	14.30	....	9.70	....	9.20	....

Daily discharge, in second-feet, of Bennett Creek near Hammett, Idaho, for the year ending Sept. 30, 1911.

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.
1	....	4.5	....	260	10	50	14	12
2	....	4.0	....	136	15	45	14	12
3	....	5.0	....	154	20	42	14	23
4	....	8.0	....	85	26	40	14	19
5	....	8.0	....	85	45	35	16	19
6	....	7.0	....	45	46	32	19	12
7	....	6.5	....	38	47	26	19	9.7
8	....	7.5	....	36	61	20	19	9.7
9	....	6.5	....	24	46	17	21	19
10	....	7.0	....	23	49	17	23	12
11	....	8.0	....	22	52	15	23	9.7
12	....	9.0	....	20	49	13	23	9.7
13	....	7.0	....	17	47	13	23	7.5
14	....	5.5	....	20	52	12	23	7.5
15	....	5.5	....	14	57	12	34	7.5
16	....	5.0	....	16	57	12	47	7.5
17	....	4.0	....	12	63	12	54	5.5
18	....	2.5	....	12	57	11	61	5.5
19	....	2.5	....	12	59	12	54	3.7
20	....	2.5	....	9.7	63	12	47	3.7
21	....	2.5	....	9.7	57	14	47	3.7
22	5.0	2.5	....	9.7	60	13	40	....
23	5.0	2.5	1.2	9.7	65	13	40	....
24	5.0	2.5	2.9	10	73	11	40	....
25	4.0	1.5	1.8	7.5	63	12	37	....
26	3.5	1.5	109	6.8	57	12	34	....
27	3.5	1.5	48	6.2	50	12	28	....
28	4.0	1.5	8.0	5.7	46	12	23	....
29	4.0	1.5	35	....	44	13	19	....
30	4.5	1.5	387	....	50	14	16	....
31	....	1.5	450	....	50	....	16	....

NOTE.—Discharge record Nov. 22 to Dec. 31 furnished by the Kings-Hill Extension Irrigation Co. Discharge Jan. 23 to June 21 determined from four fairly well-defined rating curves and by shifting-channel methods.

Monthly discharge of Bennett Creek near Hammett, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
November 22-30	5.0	3.5	4.28	76.4	
December	9.0	1.5	4.39	270	
January 23-31	450	1.2	116	2,070	D.
February	260	5.7	39.5	2,190	C.
March	73	10	49.5	3,040	B.
April	50	11	19.1	1,140	C.
May	61	14	29.1	1,790	B.
June 1-21	23	3.7	10.4	433	C.

BRUNEAU RIVER NEAR TINDALL, IDAHO.

Location.—On unsurveyed land, approximately in T. 15 S., R. 7 E. Boise meridian, near the ranch house of the Manuel Triguero ranch (later owned by Gedney & Jones), about 20 miles south of Tindall; above East Fork of Bruneau and Jarbidge Rivers and Louse, Marys, and Sheep creeks.

Records available.—August 18, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Sloping gage on left bank at the ranch house; datum unchanged.

Channel.—Rocky, rough, and practically permanent.

Discharge measurements.—Made by wading, or from a cable at the gage.

Winter flow.—Relation of gage height and discharge is not seriously affected by ice.

Accuracy.—Rating curve well defined; records good.

Discharge measurements of Bruneau River near Tindall, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Dec. 19	Lynn Crandall	0.52	38	May 5	A. B. Purton	2.28	388
				June 6	H. L. Stoner	1.85	270
1911.				July 3	do	.85	92.4
Mar. 27	O. W. Hartwell	1.49	202	Sept. 7	Lynn Crandall	0.5	10.8

Daily gage height, in feet, of Bruneau River near Tindall, Idaho, for the year ending Sept. 30, 1911.

[Frank Vensloff, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.2	0.4	0.3	0.5	2.6	0.6	2.2	1.9	1.5	0.9	0.2	0.05
2	.2	.3	.3	.5	3.1	.5	2.2	1.8	1.7	.8	.2	.05
3	.4	.3	.3	.5	1.9	.6	2.3	1.9	1.8	.9	.2	.05
4	.4	.3	.3	.5	1.6	.7	2.0	2.0	1.8	.8	.2	.05
5	.4	.3	.3	.5	1.5	.7	2.0	2.4	1.9	.8	.2	.05
6	.4	.3	.3	.5	1.1	.7	2.0	2.3	1.9	.7	.2	.05
7	.4	.3	.3	.5	.8	.7	1.8	2.2	1.8	.6	.2	.05
8	.4	.3	.3	.5	.6	.7	1.8	2.4	1.9	.6	.2	.05
9	.4	.3	.4	.9	.7	.9	1.8	2.0	1.9	.4	.2	.05
10	.4	.3	.4	.9	.8	.8	1.8	2.0	1.9	.4	.2	.05
11	.4	.3	.5	.9	.8	1.2	1.6	1.9	1.9	.4	.2	.05
12	.4	.3	.5	.9	.8	1.2	1.5	1.9	1.9	.3	.2	.05
13	.4	.3	.5	.9	.8	1.5	.9	1.9	1.9	.3	.2	.05
14	.4	.2	.5	.9	.8	1.5	1.2	2.0	2.0	.2	.2	.05
15	.5	2	.5	.7	.7	1.4	1.4	2.0	1.9	.2	.2	.05
16	.5	.2	.5	.8	.8	1.4	1.6	2.0	1.8	.2	.2	.05
17	.6	.2	.5	.4	.5	1.8	1.6	2.0	1.8	.3	.1	.05
18	.6	.3	.5	.4	.7	1.9	1.6	1.9	1.8	.3	.1	.1
19	.6	.3	.5	.6	.7	1.2	1.3	1.9	1.7	.4	.1	.1
20	.6	.3	.5	.7	.6	1.2	1.4	1.9	1.6	.4	.1	.1
21	.6	.3	.6	.4	.6	2.1	1.4	1.9	1.6	.4	.1	.1
22	.6	.3	.3	.4	.6	2.2	1.4	1.9	1.4	.3	.1	.1
23	.4	.3	.3	.2	.6	2.2	1.5	1.9	1.3	.3	.1	.1
24	.4	.4	.4	.7	.6	2.2	2.1	1.8	1.2	.3	.1	.1
25	.4	.4	.5	.9	.6	2.1	2.1	1.8	1.1	.3	.1	.1
26	.4	.5	.5	.9	.6	1.8	1.9	1.8	1.1	.3	.1	.1
27	.4	.5	.4	.6	.5	1.4	1.9	1.8	1.1	.3	.1	.1
28	.4	.5	.5	.6	.5	1.6	1.9	1.5	1.1	.3	.1	.1
29	.4	.5	.4	.7	......	1.8	2.0	1.5	1.1	.2	.1	.1
30	.4	.5	.4	.8	......	1.9	2.0	1.5	1.0	.2	.1	.1
31	.4	......	.4	2.1	......	1.7	......	1.5	......	.2	.1	......

Daily discharge, in second-feet, of Bruneau River near Tindall, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	16	30	22	39	462	50	362	290	202	92	16	9.5
2	16	22	22	39	597	39	362	267	245	76	16	9.5
3	30	22	22	39	290	50	387	290	267	92	16	9.5
4	30	22	22	39	223	62	314	314	267	76	16	9.5
5	30	22	22	39	202	62	314	412	290	76	16	9.5
6	30	22	22	39	126	62	314	387	290	62	16	9.5
7	30	22	22	39	76	62	267	362	267	50	16	9.5
8	30	22	22	39	50	62	267	412	290	50	16	9.5
9	30	22	30	92	62	92	267	314	290	30	16	9.5
10	30	22	30	92	76	76	267	314	290	30	16	9.5
11	30	22	39	92	76	144	223	290	290	30	16	9.5
12	30	22	39	92	76	144	202	290	290	22	16	9.5
13	30	22	39	92	76	202	92	290	290	22	16	9.5
14	30	16	39	92	76	202	144	314	314	16	16	9.5
15	39	16	39	62	62	182	182	314	290	16	16	9.5
16	39	16	39	76	76	182	223	314	267	16	16	9.5
17	50	16	39	30	39	267	223	314	267	22	11	9.5
18	50	22	39	30	62	290	223	290	267	22	11	11
19	50	22	39	50	62	144	163	290	245	30	11	11
20	50	22	39	62	50	144	182	290	223	30	11	11
21	50	22	50	30	50	338	182	290	223	30	11	11
22	50	22	22	30	50	362	182	290	182	22	11	11
23	30	22	22	16	50	362	202	290	163	22	11	11
24	30	30	30	62	50	362	338	267	144	22	11	11
25	30	30	39	92	50	338	338	267	126	22	11	11
26	30	39	39	92	50	267	290	267	126	22	11	11
27	30	39	30	50	39	182	290	267	126	22	11	11
28	30	39	39	50	39	223	290	202	126	22	11	11
29	30	39	30	62	....	267	314	202	126	16	11	11
30	30	39	30	76	....	290	314	202	109	16	11	11
31	30	....	30	338	....	245	....	202	....	16	11	11

NOTE.—Discharge determined from a rating curve well defined above 140 second-feet and fairly well defined below.

Monthly discharge of Bruneau River near Tindall, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	50	16	33.5	2,060	B.
November	39	16	24.8	1,480	B.
December	50	22	31.8	1,960	B.
January	338	16	66.8	4,110	A.
February	597	39	114	6,330	A.
March	362	39	186	11,400	A.
April	387	92	257	15,300	A.
May	412	202	294	18,100	A.
June	314	109	230	13,700	A.
July	92	16	35.2	2,160	A.
August	16	11	13.6	836	B.
September	11	9.5	10.2	607	B.
The year	597	9.5	108	78,000	

BRUNEAU RIVER NEAR HOT SPRING, IDAHO.

Location.—In sec. 34, T. 7 S., R. 6 E. Boise meridian, at Dunham's ranch, about 2 miles above Hot Spring post office; below all important tributaries except Jacks and Wickahoney creeks.

Records available.—July 3, 1909, to September 30, 1911.

Drainage area.—Not measured.

Gage.—A vertical staff on the right bank. The original gage, a vertical staff on right bank, about one-quarter mile above Dunham's house, was destroyed by flood March 2, 1910; on March 12, 1910, the gage was re-established close to Dunham's house at the end of the rocky cliff which is on the left bank of the stream. The datum of the present gage is unrelated to that of the original gage.

Channel.—Coarse gravel and rocks; control shifts at times.

Discharge measurements.—Made from the cable at the gage or, when stage permits, by wading.

Winter flow.—Not affected by ice.

Diversions.—Small ranch diversions only above the station. Buckaroo ditch diverts about 1 mile below the station, and about 20 miles below is the storage and diversion dam of the Owyhee Land & Irrigation Co.

Accuracy.—Ratings well defined; records reliable.

Discharge measurements of Bruneau River near Hot Spring, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Dec. 13	Lynn Crandall	4.13	202	Apr. 29	A. B. Purton	5.55	910
21	.....do	3.77	118	May 1	.....do	5.29	778
				7	.....do	6.00	1,240
1911.				June 4	H. L. Stoner	5.95	1,190
Feb. 9	.....do	3.95	162	July 5	.....do	4.6	433
Mar. 30	O. W. Hartwell	5.29	782	Sept. 3	Lynn Crandall	3.47	62

Daily gage height, in feet, of Bruneau River near Hot Spring, Idaho, for the year ending Sept. 30, 1911.

[W. N. Dunham, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	3.7	3.9	3.7	7.8	3.7	5.9	5.4	5.4	4.9	3.8	3.5
2	3.5	3.7	3.9	3.4	6.2	3.8	6.0	5.3	5.9	4.8	3.7	3.5
3	3.6	3.7	3.8	3.6	6.0	3.9	6.0	5.3	5.8	4.7	3.7	3.5
4	3.6	3.7	3.8	3.8	5.1	4.0	5.8	5.4	5.9	4.7	3.7	3.5
5	3.6	3.7	3.8	3.9	4.9	4.5	5.6	5.5	6.0	4.6	3.7	3.5
6	3.6	3.7	3.9	3.9	4.7	6.1	5.4	6.0	6.1	4.6	3.7	3.5
7	3.6	3.7	3.9	3.8	4.5	5.9	5.3	6.0	6.1	4.5	3.7	3.5
8	3.6	3.7	3.9	3.8	4.2	6.2	5.4	6.0	6.3	4.5	3.7	3.5
9	3.6	3.7	3.9	3.8	4.0	5.7	5.3	5.9	6.1	4.4	3.7	3.5
10	3.6	3.7	3.9	3.8	4.1	5.2	5.2	5.8	6.0	4.3	3.7	3.5
11	3.6	3.7	4.0	3.8	4.3	5.0	5.1	5.6	5.8	4.3	3.7	3.5
12	3.6	3.7	4.0	3.7	4.3	5.2	5.0	5.5	6.0	4.2	3.6	3.5
13	3.6	3.7	4.1	3.7	4.1	4.9	4.9	5.4	6.3	4.2	3.6	3.5
14	3.6	3.7	4.1	3.7	4.0	4.8	4.9	5.5	6.2	4.2	3.6	3.5
15	3.6	3.7	4.1	3.8	4.0	4.7	4.8	5.5	6.2	4.2	3.6	3.5
16	3.6	3.7	3.9	3.8	4.0	4.8	4.0	5.7	6.3	4.2	3.6	3.5
17	3.6	3.8	3.8	3.6	3.9	5.0	4.8	5.8	6.2	4.1	3.6	3.5
18	3.7	3.7	3.9	3.5	3.7	5.4	4.8	5.6	6.1	4.1	3.6	3.5
19	3.7	3.8	3.9	3.7	3.9	5.4	4.8	5.5	5.9	4.1	3.5	3.5
20	3.8	3.8	3.8	4.0	4.0	5.4	4.9	5.4	5.9	4.2	3.5	3.5
21	3.7	3.8	3.8	3.9	3.8	5.4	4.9	5.3	5.8	4.1	3.5	3.5
22	3.7	3.8	3.8	3.6	3.7	5.6	4.9	5.3	5.6	4.1	3.5	3.5
23	3.7	3.8	3.7	3.3	3.9	5.9	4.9	5.3	5.5	4.0	3.5	3.5
24	3.7	3.9	3.7	3.6	4.0	6.0	5.0	5.5	5.3	4.0	3.5	3.5
25	3.7	3.9	3.7	3.9	4.0	3.9	5.1	5.8	5.2	4.0	3.5	3.5
26	3.7	4.0	3.8	4.2	4.7	5.8	5.3	5.7	5.1	3.9	3.5	3.5
27	3.7	3.9	3.8	4.1	3.8	5.3	5.5	5.6	5.0	3.9	3.5	3.5
28	3.7	3.8	3.7	4.0	3.7	5.1	5.5	5.5	5.0	3.8	3.5	3.5
29	3.7	3.0	3.7	4.1	......	5.1	5.6	5.4	4.9	3.8	3.5	3.5
30	3.7	3.9	3.8	4.2	......	5.3	5.4	5.3	4.9	3.8	3.5	3.5
31	3.7	......	3.8	4.6	......	5.7	......	5.3	......	3.8	3.5	......

Daily discharge, in second-feet, of Bruneau River near Hot Spring, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	65	101	145	101	2,500	101	1,160	842	842	553	122	65
2	65	101	145	51	1,370	122	1,230	782	1,160	500	101	65
3	82	101	122	82	1,230	145	1,230	782	1,100	450	101	65
4	82	101	122	122	664	172	1,100	842	1,160	450	101	65
5	82	101	122	145	553	356	966	904	1,230	402	101	65
6	82	101	145	145	450	1,300	842	1,230	1,300	402	101	65
7	82	101	145	122	356	1,160	782	1,230	1,300	356	101	65
8	82	101	145	122	236	1,370	842	1,230	1,430	356	101	65
9	82	101	145	122	172	1,030	782	1,160	1,300	313	101	65
10	82	101	145	122	202	722	722	1,100	1,230	273	101	65
11	82	101	172	122	273	608	664	966	1,100	273	101	65
12	82	101	172	101	273	722	608	904	1,230	236	82	65
13	82	101	202	101	202	553	553	842	1,430	236	82	65
14	82	101	202	101	172	500	553	904	1,370	236	82	65
15	82	101	202	122	172	450	500	904	1,370	236	82	65
16	82	101	145	122	172	500	553	1,030	1,430	236	82	65
17	82	122	122	82	145	608	500	1,100	1,370	202	82	65
18	101	101	145	65	101	842	500	966	1,300	202	82	65
19	101	122	145	101	145	842	500	904	1,160	202	65	65
20	122	122	122	172	172	842	553	842	1,160	236	65	65
21	101	122	122	145	122	842	553	782	1,100	202	65	65
22	101	122	122	82	101	966	553	782	966	202	65	65
23	101	122	101	40	145	1,160	553	782	904	172	65	65
24	101	145	101	82	172	1,230	608	904	782	172	65	65
25	101	145	101	145	172	1,160	664	1,100	722	172	65	65
26	101	172	122	236	450	1,100	782	1,030	664	145	65	65
27	101	145	122	202	122	782	904	966	608	145	65	65
28	101	122	101	172	101	664	904	904	608	122	65	65
29	101	145	101	202	....	664	966	842	553	122	65	65
30	101	145	122	236	....	782	842	782	553	122	65	65
31	101	....	122	402	....	1,030	....	782	....	122	65	....

NOTE.—Discharge determined from a rating curve well defined below 1,600 second-feet.

Monthly discharge of Bruneau River near Hot Spring, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	122	65	90.2	5,550	A.
November	172	101	116	6,900	A.
December	202	101	134	8,240	A.
January	402	40	134	8,240	A.
February	2,500	101	391	21,700	A.
March	1,370	101	752	46,200	A.
April	1,230	500	749	44,600	A.
May	1,230	782	939	57,700	A.
June	1,430	553	1,080	64,300	A.
July	553	122	260	16,000	A.
August	122	65	82.3	5,060	A.
September	65	65	65.0	3,870	A.
The year	2,500	40	399	288,000	

BRUNEAU RIVER NEAR GRANDVIEW, IDAHO.

Location.—In sec. 1, T. 6 S., R. 4 E. Boise meridian, about one-fourth mile below the diversion dam of the Owyhee Land & Irrigation Co., 1 mile above Comet post office, 10 miles east of Grandview, and about 1½ miles above the mouth of Bruneau River; below all tributaries.

Records available.—January 1, 1895, to December 31, 1903, and May 1, 1909, to September 30, 1911.

Drainage area.—Not accurately known.

Gage.—A vertical gage installed March 10, 1910, with the datum 0.87 lower than that of the gage destroyed by flood March 2, 1910.

Channel.—Gravel; shifts at extreme stages.

Discharge measurements.—Made from cable just above the gage, or at low stages by wading.

Diversions.—No diversions below the station. The canal of the Owyhee Land & Irrigation Co. diverts about one-quarter mile above the station and has a capacity of about 250 second-feet.

Winter flow.—Not seriously affected by ice.

Accuracy.—Rating curves well defined; records reliable.

Discharge measurements of Bruneau River near Grandview, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Dec. 22	Lynn Crandall	2.66	156	May 2	A. B. Purton	3.65	766
				June 3	H. L. Stoner	3.85	873
1911.				July 1	.....do	3.28	469
Feb. 7	.....do	3.20	409	Sept. 1	Lynn Crandall	2.02	19.1
Mar. 30	O. W. Hartwell	4.02	1,040				

Daily gage height, in feet, of Bruneau River near Grandview, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.4	2.5	2.7	2.6	5.0	2.7	4.5	3.8	3.6	3.3	2.1	2.0
2	2.4	2.5	2.7	2.6	5.15	2.7	4.1	3.65	3.7	3.2	2.1	2.0
3	2.4	2.5	2.7	2.5	4.5	2.8	4.1	3.8	3.7	3.1	2.1	1.7
4	2.4	2.5	2.8	2.8	3.9	2.8	4.1	3.9	3.8	3.0	2.1	1.7
5	2.5	2.5	2.8	2.8	3.5	3.3	4.0	3.9	3.8	3.0	2.1	1.7
6	2.5	2.5	2.7	2.7	3.4	3.95	3.9	3.9	4.0	3.0	2.0	1.7
7	2.5	2.5	2.7	2.7	3.3	4.1	3.8	4.0	4.0	2.9	2.0	1.7
8	2.5	2.5	2.7	2.6	3.1	4.2	3.7	4.0	4.2	3.0	2.0	1.8
9	2.3	2.5	2.7	2.6	3.0	4.2	3.5	4.0	4.5	3.0	2.0	1.8
10	2.4	2.5	2.8	2.6	2.9	3.8	3.6	3.9	4.3	3.0	2.0	1.8
11	2.4	2.5	2.9	2.6	3.0	3.8	3.6	3.9	4.2	2.8	2.0	1.8
12	2.4	2.5	3.2	2.6	3.1	3.8	3.5	3.9	4.1	2.6	2.0	1.8
13	2.4	2.6	2.9	2.6	3.0	3.7	3.7	3.9	4.2	2.5	2.0	1.8
14	2.4	2.6	2.9	2.6	3.0	3.5	3.7	4.0	4.2	2.5	2.0	1.8
15	2.4	2.6	2.8	2.6	2.9	3.5	3.5	4.0	4.3	2.7	2.0	1.8
16	2.4	2.6	2.8	2.6	2.8	3.3	3.2	4.0	4.4	2.7	2.0	1.8
17	2.6	2.6	2.7	2.6	2.8	3.7	3.2	4.0	4.2	2.7	2.0	1.8
18	2.6	2.6	2.7	2.6	2.6	3.7	3.2	4.0	4.2	2.5	2.0	1.8
19	2.6	2.6	2.7	2.6	2.7	4.2	3.3	3.9	4.1	2.4	2.0	1.8
20	2.5	2.6	2.7	2.7	2.9	4.8	3.3	3.8	4.4	2.4	2.0	1.8
21	2.5	2.6	2.7	2.8	2.7	5.2	3.3	3.8	4.0	2.4	2.0	1.8
22	2.5	2.7	2.7	2.6	2.6	5.0	3.3	3.8	3.9	2.3	2.0	1.8
23	2.5	2.7	2.6	2.5	2.7	4.9	3.3	3.8	3.8	2.3	2.0	1.8
24	2.5	2.7	2.6	2.5	2.7	4.9	3.3	3.9	3.6	2.3	2.6	1.8
25	2.5	2.8	2.6	2.7	3.1	4.8	3.3	4.0	3.5	2.0	2.6	1.8
26	2.5	2.8	2.6	2.9	2.8	4.2	3.5	4.1	3.4	2.0	2.3	1.8
27	2.5	2.8	2.6	3.0	2.8	4.0	4.0	4.2	3.3	2.0	1.7	1.8
28	2.5	2.7	2.6	3.0	2.7	3.8	3.8	4.0	3.3	2.0	2.1	1.8
29	2.5	2.8	2.6	2.8	....	3.8	3.8	3.9	3.4	2.0	2.2	1.8
30	2.5	2.7	2.6	3.3	....	3.9	3.8	3.8	3.3	2.0	2.0	1.8
31	2.5	....	2.6	3.5	....	4.1	....	3.6	....	2.0	2.0	....

Daily discharge, in second-feet, of Bruneau River near Grandview, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	82	106	167	135	2,010	168	1,510	870	705	477	29	16
2	82	106	167	135	2,170	168	1,140	745	785	411	29	16
3	82	106	167	107	1,510	206	1,140	870	785	351	29	1
4	82	106	205	206	955	206	1,140	955	870	297	29	1
5	106	106	205	206	625	477	1,040	955	870	297	29	1
6	106	106	167	168	549	1,000	955	955	1,040	297	16	1
7	106	106	167	168	477	1,140	870	1,040	1,040	249	16	1
8	106	106	167	135	351	1,220	785	1,040	1,220	297	16	2
9	62	106	167	135	297	1,220	625	1,040	1,510	297	16	2
10	82	106	205	135	249	870	705	955	1,320	297	16	2
11	82	106	248	135	297	870	705	955	1,220	206	16	2
12	82	106	412	135	351	870	625	955	1,140	135	16	2
13	82	134	248	135	297	785	785	955	1,220	107	16	2
14	82	134	248	135	297	625	785	1,040	1,220	107	16	2
15	82	134	205	135	249	625	625	1,040	1,320	168	16	2
16	82	134	205	135	206	477	411	1,040	1,420	168	16	2
17	134	134	167	135	206	785	411	1,040	1,220	168	16	2
18	134	134	167	135	135	785	411	1,040	1,220	107	16	2
19	134	134	167	135	168	1,220	477	955	1,140	83	16	2
20	106	134	167	168	249	1,810	477	870	1,420	83	16	2
21	106	134	167	206	168	2,220	477	870	1,040	83	16	2
22	106	167	167	135	135	2,010	477	870	955	62	16	2
23	106	167	134	107	168	1,910	477	870	870	62	16	2
24	106	167	134	107	168	1,910	477	955	705	62	135	2
25	106	205	134	168	351	1,810	477	1,040	625	16	135	2
26	106	205	134	249	206	1,220	625	1,140	549	16	62	2
27	106	205	134	297	206	1,040	1,040	1,220	477	16	1	2
28	106	167	134	297	168	870	870	1,040	477	16	29	2
29	106	205	134	206	....	870	870	955	549	16	44	2
30	106	167	134	477	....	955	870	870	477	16	16	2
31	106	....	134	625	....	1,140	....	705	....	16	16	....

NOTE.—Discharge determined from a rating curve well defined below 2,000 second-feet, except at extreme low stages.

Monthly discharge of Bruneau River near Grandview, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	134	82	98.8	6,080	A.
November	205	106	138	8,210	A.
December	412	134	179	11,000	A.
January	625	107	187	11,500	A.
February	2,170	135	472	26,200	A.
March	2,220	168	1,020	62,700	A.
April	1,510	411	743	44,200	A.
May	1,220	705	963	59,200	A.
June	1,510	477	980	58,300	A.
July	477	16	161	9,900	A.
August	135	1	28.1	1,730	B.
September	16	1	2.8	167	C.
The year	2,220	1	413	299,000	

SHEEP CREEK NEAR TINDALL, IDAHO.

Location.—On unsurveyed land, approximately in T. 15 S., R. 5 E. Boise meridian, at Roberson's ranch, formerly Scott's, about 1 mile above Cowan's ranch, 6 miles above the Eastman & Anderson ranch, 12 miles south of Tindall post office, 6 miles below Bull Creek, and 2 miles above Cat Creek.

Records available.—December 18, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on left bank in Roberson's hay meadow, about one-fourth mile above the house; datum unchanged.

Channel.—Gravel; fills in at times during summer and fall with leaves and trash.

Discharge measurements.—Made by wading, or, when water is high, from a footbridge. The footbridge at Cowan's ranch, 1 mile below, affords a better measuring section during high water.

Diversions.—Water is diverted on to hay meadows above and below the station.

Accuracy.—Rating curve well defined; records as a whole, good.

Discharge measurements of Sheep Creek near Tindall, Idaho, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Dec. 18	Lynn Crandall	1.56	10.6	May 4	A. B. Purton	3.49	176
19	....do	1.50	9.0	5	....do	3.6	171
				June 7	H. L. Stoner	2.7	82.9
1911.				July 3	....do	1.95	25.1
Mar. 28	O. W. Hartwell	3.13	128	Sept. 6	Lynn Crandall	1.2	[a] .1

[a] Estimated.

Daily gage height, in feet, of Sheep Creek near Tindall, Idaho, for the year ending Sept. 30, 1911.

[George Scott, observer.]

Day.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1		1.6	5.2	1.8	4.6	3.2	2.8	2.1	1.4	1.2
2		1.5	4.15	1.9	4.2	2.8	2.8	2.0	1.4	1.2
3		1.3	3.6	1.9	3.9	3.0	2.85	2.0	1.4	1.2
4		1.6	2.6	2.0	3.7	3.4	2.9	1.9	1.3	1.2
5		1.6	1.9	2.5	3.85	3.7	2.8	1.85	1.3	1.2
6		1.55	1.8	2.4	3.7	3.65	2.8	1.8	1.3	1.2
7		1.6	1.8	3.85	3.35	3.5	2.7	1.7	1.3	1.2
8		1.6	1.9	2.1	3.5	3.35	2.85	1.6	1.3	1.2
9		1.6	1.9	1.95	3.6	3.1	2.8	1.6	1.3	1.2
10		1.6	1.7	2.5	3.65	3.25	2.7	1.6	1.3	1.2
11		1.5	1.7	2.5	3.0	3.05	2.7	1.6	1.3	1.2
12		1.6	1.7	2.2	3.05	3.15	2.7	1.5	1.3	1.2
13		1.6	1.7	1.8	2.75	3.1	2.6	1.5	1.2	1.2
14		1.7	1.6	1.9	2.5	3.1	2.6	1.5	1.2	1.2
15		1.7	1.6	2.15	2.55	3.35	2.6	1.5	1.2	1.2
16		1.6	1.6	2.6	2.85	3.75	2.6	1.5	1.2	1.2
17		1.6	1.6	3.15	2.7	3.5	2.55	1.5	1.2	1.2
18	1.6	1.7	1.6	3.5	3.0	3.35	3.05	1.5	1.2	1.2
19	1.4	1.7	1.6	3.9	3.3	3.3	3.45	1.5	1.2	1.2
20	1.5	1.7	1.6	3.9	3.15	3.25	2.65	1.5	1.2	1.3
21	1.3	1.6	1.6	4.2	3.15	3.05	2.4	1.5	1.2	1.3
22	1.6	1.6	1.6	4.6	3.25	3.0	2.3	1.5	1.2	1.3
23	1.6	1.6	1.6	4.65	3.3	3.3	2.2	1.5	1.2	1.3
24	1.6	1.6	1.6	4.75	3.55	3.25	2.1	1.5	1.2	1.3
25	1.5	1.7	1.6	4.65	3.6	3.0	2.1	1.5	1.2	1.3
26	1.3	1.7	1.7	4.65	3.8	2.95	2.0	1.5	1.2	1.3
27	1.5	1.7	1.7	4.2	3.65	3.05	2.0	1.4	1.2	1.3
28	1.5	1.7	1.8	3.8	3.8	2.85	2.0	1.4	1.2	1.4
29	1.5	1.9		3.8	3.7	2.8	2.15	1.4	1.2	1.4
30	1.4	3.1		3.8	3.1	2.8	2.15	1.4	1.2	1.4
31	1.5	6.1		4.2		2.8		1.4	1.2	

NOTE.—Gage heights probably not seriously affected by ice.

Daily discharge, in second-feet, of Sheep Creek near Tindall, Idaho, for the year ending Sept. 30, 1911.

Day.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	12	442	18	337	137	91	34	5.0	0.5
2	....	9.0	266	23	274	91	91	28	4.5	.5
3	....	4.8	188	23	230	113	96	28	4.2	.5
4	....	12	71	28	202	162	102	23	4.0	.5
5	....	12	23	62	223	202	91	21	3.8	.5
6	....	10	18	54	202	195	91	18	3.6	.5
7	....	12	18	223	156	175	81	15	3.3	.5
8	....	12	23	34	175	156	96	12	3.0	.5
9	....	12	23	26	188	125	91	12	2.6	.5
10	....	12	15	62	195	143	81	12	2.2	.5
11	....	9	15	62	113	119	81	12	2.0	.5
12	....	12	15	40	119	131	81	9.0	1.7	.5
13	....	12	15	18	86	125	71	9.0	1.4	.5
14	....	15	12	23	62	125	71	9.0	1.2	.5
15	....	15	12	37	66	156	71	9.0	1.0	.5
16	....	12	12	71	96	209	71	9.0	.9	.5
17	....	12	12	131	81	175	66	9.0	.8	.5
18	12	15	12	175	113	156	119	9.0	.7	.5
19	6.8	15	12	230	149	149	168	9.0	.6	.5
20	9.0	15	12	230	131	143	76	9.0	.6	1.1
21	4.8	12	12	274	131	119	54	8.5	.5	1.1
22	12	12	12	337	143	113	47	8.5	.5	1.1
23	12	12	12	346	149	149	40	8.5	.5	1.1
24	12	12	12	362	182	143	34	8.0	.5	1.1
25	9.0	15	12	346	188	113	34	8.0	.5	1.1
26	4.8	15	15	346	216	108	28	8.0	.5	1.1
27	9.0	15	15	274	195	119	28	7.0	.5	1.1
28	9.0	15	18	216	216	96	28	6.5	.5	2.0
29	9.0	23	....	216	202	91	37	6.5	.5	2.0
30	6.8	125	....	216	125	91	37	6.0	.5	2.0
31	9.0	620	....	274	....	91	....	5.5	.5	....

NOTE.—Discharge determined as follows: Dec. 18 to July 18 from a curve well defined between 7 and 230 second-feet; July 19 to Aug. 21 by shifting channel methods; Aug. 22 to Sept. 30, from a curve fairly well defined below 200 second-feet.

Monthly discharge of Sheep Creek near Tindall, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
December 18-31	12	4.8	8.94	248	A.
January	620	4.8	36.0	2,210	A.
February	442	12	47.3	2,630	A.
March	362	18	154	9,470	B.
April	337	62	165	9,820	B.
May	209	91	136	8,360	A.
June	168	28	71.8	4,270	A.
July	34	5.5	12.2	750	B.
August	5	.5	1.70	105	B.
September	2	.5	.81	48	B.
The period	....	....	....	37,900	

MARYS CREEK AT TINDALL, IDAHO.

Location.—In sec. 28, T. 13 S., R. 5 E. Boise meridian, at Tindall ranch and post office, about half a mile above the mouth of Rattlesnake Creek.

Records available.—September 16, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on left bank; datum unchanged.

Channel.—Gravel, and fairly permanent. Left bank overflows at highest stages.

Discharge measurements.—By wading or, when stage requires, from a suspension footbridge about 10 feet above the gage.

Diversions.—Two small ranch ditches divert around the station. Their combined maximum capacity is probably not over 8 second-feet.

Winter flow.—Not affected by ice to any great extent.

Accuracy.—Rating curve fairly well defined; records reliable.

Discharges measurement of Marys Creek at Tindall, Idaho, the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
1910.				1911.			
Dec. 16	Lynn Crandall..........	2.46	9.6	May 4	A. B. Purton...........	3.16	64.4
				6	.....do..................	3.32	80.7
1911.				June 7	H. L. Stoner...........	2.80	31.3
Mar. 27	O. W. Hartwell.........	3.44	84.0	July 2	.....do..................	2.30	5.1

Daily gage height, in feet, of Marys Creek at Tindall, Idaho, for the year ending Sept. 30, 1911.

[Edith Tindall, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1	2.0	2.2	2.4	2.1	3.7	2.3	4.1	3.4	2.7	2.2	2.0
2	2.0	2.2	2.4	2.1	3.5	2.3	4.2	3.5	2.7	2.2	....
3	2.0	2.3	2.4	2.2	3.4	2.3	4.0	3.3	2.8	2.1	....
4	2.0	2.3	2.4	2.2	3.3	2.3	3.7	3.2	2.9	2.1	....
5	2.0	2.3	2.4	2.2	3.0	2.3	3.6	3.2	2.9	2.1	....
6	2.0	2.3	2.5	2.2	2.8	2.4	3.5	3.3	2.9	2.0	....
7	2.0	2.3	2.5	2.2	2.7	2.4	3.3	3.2	2.8	2.0	....
8	2.0	2.3	2.6	2.3	2.5	2.5	3.2	3.1	3.0	2.0	....
9	2.0	2.3	2.7	2.3	2.6	2.5	3.1	2.9	3.1	2.0	....
10	2.0	2.3	2.8	3.3	2.7	2.8	3.3	2.9	3.0	2.2	....
11	2.0	2.3	2.9	2.3	2.5	2.6	3.4	2.8	2.9	2.2	....
12	2.0	2.3	2.9	2.3	2.6	2.7	2.9	2.8	2.8	2.0	....
13	2.0	2.4	2.8	2.4	2.5	2.7	2.9	2.8	2.7	2.0	....
14	2.0	2.4	2.7	2.4	2.5	2.8	2.8	2.8	2.6	2.0	....
15	2.0	2.3	2.6	2.4	2.4	2.9	2.7	2.9	2.4	2.0	....
16	2.0	2.3	2.5	2.4	2.4	3.0	2.6	3.1	2.4	2.0	....
17	2.0	2.3	2.4	2.4	2.4	3.75	2.7	3.0	2.3	2.0	....
18	2.0	2.3	2.4	2.3	2.4	4.2	2.8	2.9	2.2	2.0	....
19	2.0	2.3	2.3	2.3	2.4	4.1	2.8	2.9	2.2	2.0	....
20	2.0	2.3	2.3	2.3	2.3	3.7	2.9	2.8	2.2	2.0	....
21	2.0	2.3	2.3	2.3	2.3	4.3	2.9	2.8	2.2	2.1	....
22	2.2	2.3	2.3	2.3	2.3	4.25	3.4	2.8	2.1	2.1	....
23	2.2	2.3	2.3	2.3	2.2	4.65	3.4	2.8	2.1	2.1	....
24	2.3	2.3	2.3	2.4	2.2	4.6	3.4	2.8	2.1	2.1	....
25	2.2	2.3	2.3	2.4	2.2	4.15	3.4	2.7	2.1	2.1	....
26	2.2	2.3	2.2	2.5	2.2	3.45	3.5	2.7	2.3	2.1	....
27	2.2	2.4	2.2	2.5	2.3	3.5	3.7	2.7	2.4	2.0	....
28	2.2	2.4	2.2	2.6	2.3	3.7	4.0	2.9	2.2	2.0	....
29	2.1	2.4	2.2	2.7	....	3.8	3.4	3.0	2.2	2.0	....
30	2.1	2.4	2.1	5.65	....	4.0	3.4	3.1	2.2	2.0	....
31	2.1	....	2.1	4.85	....	4.0	....	2.9	....	2.0	....

NOTE.—Gage heights probably not affected by ice. Water standing in pools Oct. 1 to 21 and July 27 to Sept. 30. Banks overflowed Jan. 30 to 31.

Daily discharge, in second-feet, of Marys Creek at Tindall, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.
1	0.0	2.4	8.0	0.7	125	4.8	175	90	24	2.4
2	.0	2.4	8.0	.7	101	4.8	188	101	24	2.4
3	.0	4.8	8.0	2.4	90	4.8	162	79	31	.7
4	.0	4.8	8.0	2.4	79	4.8	125	68	39	.7
5	.0	4.8	8.0	2.4	48	4.8	113	68	39	.7
6	.0	4.8	12	2.4	31	8.0	101	79	39	.0
7	.0	4.8	12	2.4	24	8.0	79	68	31	.0
8	.0	4.8	17	4.8	12	12	68	58	48	.0
9	.0	4.8	24	4.8	17	12	58	39	58	.0
10	.0	4.8	31	4.8	24	31	79	39	48	2.4
11	.0	4.8	39	4.8	12	17	90	31	39	2.4
12	.0	4.8	39	4.8	17	24	39	31	31	.0
13	.0	8.0	31	8.0	12	24	39	31	24	.0
14	.0	8.0	24	8.0	12	31	31	31	17	.0
15	.0	4.8	17	8.0	8.0	39	24	39	8	.0
16	.0	4.8	12	8.0	8.0	48	17	58	8	.0
17	.0	4.8	8.0	8.0	8.0	131	24	48	4.8	.0
18	.0	4.8	8.0	4.8	8.0	188	31	39	2.4	.0
19	.0	4.8	4.8	4.8	8.0	175	31	39	2.4	.0
20	.0	4.8	4.8	4.8	4.8	125	39	31	2.4	.0
21	.0	4.8	4.8	4.8	4.8	201	39	31	2.4	.7
22	2.4	4.8	4.8	4.8	4.8	194	90	31	.7	.7
23	2.4	4.8	4.8	4.8	2.4	247	90	31	.7	.7
24	4.8	4.8	4.8	8.0	2.4	240	90	31	.7	.7
25	2.4	4 8	4.8	8.0	2.4	182	90	24	.7	.7
26	2.4	4.8	2.4	12	2.4	96	101	24	4.8	.1
27	2.4	8.0	2.4	12	4.8	79	125	24	8.0	.0
28	2.4	8.0	2.4	17	4.8	125	162	39	2.4	.0
29	.7	8.0	2.4	24	....	137	90	48	2.4	.0
30	.7	8.0	.7	500	....	162	90	58	2.4	.0
31	.7	....	.7	300	....	162	....	39	....	.0

NOTE.—Discharge determined from a rating curve well defined between 24 and 130 second-feet and fairly well defined below 24 second-feet. Discharge Jan. 30 to 31 estimated.

Monthly discharge of Marys Creek at Tindall, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	4.8	0.0	0.69	42	C.
November	8.0	2.4	5.28	314	B.
December	39	.7	11.6	713	B.
January	500	0.7	31.8	1,960	C.
February	125	2.4	24.2	1,340	B.
March	247	4.8	87.8	5,400	B.
April	188	17	82.7	4,920	A.
May	101	24	46.7	2,870	A.
June	58	.7	18.2	1,080	B.
July	2.4	.0	.51	31	C.
August	.0	.0	.00	0	
September	.0	0	.00	0	
The year	500	0	25.8	18,700	

EAST FORK OF BRUNEAU RIVER NEAR HOT SPRING, IDAHO.

Location.—On unsurveyed land at the ranch known as Winter Camp, about three-fourths of a mile below the ranch house, about 22 miles from Hot Spring post office.

Records available.—August 13, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on left bank at the lower end of the valley; datum unchanged.

Channel.—Gravel and sand; shifts at section, but control seems permanent.

Discharge measurements.—Made from a suspension footbridge just below the gage or, when practicable, by wading.

Diversions.—Small ranch diversions only.

Winter flow.—Relation between gage height and discharge affected by ice.

Accuracy.—Rating curve well defined.

Discharge measurements of East Fork of Bruneau River near Hot Spring, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Dec. 12	Lynn Crandall	3.79	15.6	Mar. 25	O. W. Hartwell	5.24	69.1
12	.....do	3.78	14.8	Apr. 30	A. B. Purton	5.45	79.6
13	.....do	3.74	13.8	June 4	H. L. Stoner	5.50	89.2
				July 5	.....do	3.95	19.1
1911.				Sept. 2	Lynn Crandall	2.78	.8
Feb. 6[a]	.....do	4.3	22.0				

[a] Ice present.

Daily gage height, in feet, of East Fork of Bruneau River near Hot Spring, Idaho, for the year ending Sept. 30, 1911.

[Wilkins, Stimson, and Roscoe, observers.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Sept.
1	....	3.3	3.4	3.7	....	3.7	4.9	5.3	5.0	4.9	....
2	3.1	3.4	3.4	3.6	....	3.9	5.2	5.2	5.0	4.6	2.78
3	3.2	3.4	3.5	3.6	....	4.1	5.2	5.1	5.0	4.5	2.8
4	3.2	3.4	3.5	3.5	....	5.2	5.6	5.1	5.5	....	2.8
5	3.2	3.4	3.5	3.5	....	5.95	5.4	5.1	5.6	....	2.8
6	3.2	3.4	3.5	3.8	....	10.0	5.3	5.1	5.6	....	2.8
7	3.2	3.4	3.5	3.8	....	10.5	5.3	5.7	5.5	....	2.8
8	3.3	3.4	3.5	3.8	4.3	10.65	5.3	6.05	5.6	....	2.9
9	3.3	3.4	3.6	3.8	4.0	10.3	5.1	6.1	5.6	....	2.9
10	3.3	3.5	3.7	3.8	3.8	9.0	4.9	6.1	5.7	....	2.9
11	3.3	3.5	3.8	4.0	3.8	7.6	4.9	6.0	5.4	....	3.0
12	3.3	3.5	3.8	....	4.1	8.1	4.9	5.9	5.2	....	3.0
13	3.2	3.5	3.8	....	4.1	7.9	4.8	5.7	5.0	3.3	3.0
14	3.2	3.5	3.7	....	4.1	5.8	4.7	5.3	4.9	3.3	3.0
15	3.2	3.5	3.5	....	4.2	5.9	4.7	5.1	5.0	3.2	3.0
17	3.3	3.5	3.3	....	4.0	6.4	4.6	5.4	5.6	3.2	3.0
18	3.3	3.5	3.3	....	3.9	6.9	4.5	5.9	5.4	3.2	3.0
19	3.4	3.5	3.5	....	3.8	6.8	4.4	5.7	5.0	3.2	3.0
19	3.4	3.5	3.6	....	4.1	5.3	4.4	5.5	5.1	3.2	3.0
20	3.4	3.3	3.6	....	4.0	5.0	4.35	5.5	4.9	....	3.0
21	3.4	3.2	3.6	....	4.0	4.8	4.3	5.4	4.9	....	3.0
22	3.4	3.4	3.6	....	4.0	4.7	4.7	5.3	4.7	....	3.0
23	3.4	3.4	3.5	....	4.0	4.8	4.7	5.2	4.7	....	3.0
24	3.4	3.3	3.5	....	4.0	5.0	4.6	5.2	4.6	....	3.1
25	3.4	3.3	3.5	....	3.9	5.2	4.6	5.2	4.6	....	3.1
26	3.4	3.2	3.5	....	3.9	5.3	4.5	5.2	4.5	....	3.1
27	3.4	3.4	3.5	....	3.8	5.3	4.5	5.2	4.5	....	3.1
28	3.4	3.5	3.5	....	3.7	4.9	5.2	5.6	4.6	....	3.1
29	3.4	3.6	3.4	....	....	4.9	5.6	5.5	4.6	....	3.1
30	3.3	3.6	3.4	....	....	4.7	5.5	5.3	4.7	....	3.1
31	3.3	....	3.4	....	....	4.7	....	5.0	....	....	....

NOTE.—Gage heights affected by ice Jan. 1 to about Mar. 13; gage not read July 4 to 12, and July 20 to Sept. 1.

Daily discharge, in second-feet, of East Fork of Bruneau River near Hot Spring, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Sept.
1	2.9	5.5	7.0	....	180	10	54	74	59	54	0.6
2	2.9	7.0	7.0	....	110	15	69	69	59	41	.6
3	4.1	7.0	8.8	....	50	20	69	64	59	37	.7
4	4.1	7.0	8.8	....	35	50	90	64	85	32	.7
5	4.1	7.0	8.8	....	35	100	80	64	90	27	.7
6	4.1	7.0	8.8	....	30	400	74	64	90	24	.7
7	4.1	7.0	8.8	....	30	450	74	96	85	21	.7
8	5.5	7.0	8.8	....	22	450	74	117	90	18	1.2
9	5.5	7.0	11	....	20	400	64	120	90	15	1.2
10	5.5	8.8	13	....	....	300	54	120	96	12	1.2
11	5.5	8.8	15	....	....	200	54	114	80	9.0	1.9
12	5.5	8.8	15	....	....	200	54	108	69	6.0	1.9
13	4.1	8.8	15	....	....	200	49	96	59	5.5	1.9
14	4.1	8.8	13	....	....	102	45	74	54	5.5	1.9
15	4.1	8.8	8.8	....	....	108	45	64	59	4.1	1.9
16	5.5	8.8	5.5	....	....	138	41	80	90	4.1	1.9
17	5.5	8.8	5.5	....	....	169	37	108	80	4.1	1.9
18	7.0	8.8	8.8	....	....	162	33	96	59	4.1	1.9
19	7.0	8.8	11	....	....	74	33	85	64	4.1	1.9
20	7.0	5.5	11	....	....	59	31	85	54	....	1.9
21	7.0	4.1	11	....	....	49	30	80	54	....	1.9
22	7.0	7.0	11	....	....	45	45	74	45	....	1.9
23	7.0	7.0	8.8	....	....	49	45	69	45	....	1.9
24	7.0	5.5	8.8	20	....	59	41	69	41	....	2.9
25	7.0	5.5	8.8	20	....	69	41	69	41	....	2.9
26	7.0	4.1	8.8	40	....	74	37	69	37	....	2.9
27	7.0	7.0	8.8	50	....	74	37	69	37	....	2.9
28	7.0	8.8	8.8	60	....	54	69	90	41	....	2.9
29	7.0	11	7.0	180	....	54	90	85	41	....	2.9
30	5.5	11	7.0	250	....	45	85	74	45	....	2.9
31	5.5	....	7.0	340	....	45	....	59	....	....	....

NOTE.—Discharge for periods in which gage heights were unaffected by ice determined from a rating curve well defined between 2 and 100 second-feet. Discharges Jan. 24 to Feb. 9, Mar. 1 to 13 and July 4 to 12 estimated. Mean discharge estimated as follows: Jan. 1 to 23, 10 second-feet; Feb. 10 to 28, 10 second feet; July 20 to 31, 3.0 second-feet; August, 1.5 second-feet.

Monthly discharge of East Fork of Bruneau River near Hot Spring, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	7.0	2.9	5.55	341	A.
November	11	4.1	7.53	448	A.
December	15	5.5	9.52	585	A.
January	340	....	38.4	2,360	D.
February	180	....	25.1	1,390	D.
March	450	....	136	8,360	D.
April	90	30	54.8	3,260	A.
May	120	59	82.9	5,100	A.
June	96	37	63.3	3,770	A.
July	54	....	11.7	719	C.
August	....	....	1.50	92.2	D.
September	2.9	.6	1.78	106	B.
The year	450	.6	36.7	26,500	

LOUSE CREEK NEAR WICKAHONEY, IDAHO.

Location.—On unsurveyed land at the Blackstone ranch, which is on the road from Hot Spring to Grasmere, 27 miles from Hot Spring, about 12 miles from Grasmere, and about 15 miles east of Wickahoney.

Records available.—January 30 to June 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff installed December 15, 1910, on right bank about one-quarter mile above road crossing.

Channel.—Gravel.

Discharge measurements.—By wading or, if necessary, from the bridge.

Diversions.—A small reservoir is located just below the road which stores practically the whole flow of Louse Creek.

Accuracy.—Records approximate, as high-stage measurements are lacking.

Discharge measurements of Louse Creek near Wickahoney, Idaho, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Mar. 29	O. W. Hartwell	3.01	36.4
May 3	A. B. Purton	1.75	2.9
June 5	H. L. Stoner	1.60	.3

Daily gage height, in feet, and discharge, in second-feet, of Louse Creek near Wickahoney, Idaho, for 1911.

[Clarence Dickens, observer.]

Day.	January.		February.		March.		April.		May.		June.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1			3.8	68	1.5	0.4			2.0	6.3	1.5	0.4
2			2.5	19	1.6	.9			1.9	4.4	1.5	.4
3			2.0	6.3	1.6	.9			1.8	2.9	1.6	.9
4			1.6	.9	1.8	2.9			1.7	1.7	1.6	.9
5			1.5	.4	5.7	163	2.1	8.4	1.7	1.7	1.6	.9
6			1.8	2.9	4.6	108	2.35	14.7	1.7	1.7	1.6	.9
7			1.8	2.9	3.3	48	2.2	10.7	1.7	1.7	1.6	.9
8			1.7	1.7	2.1	8.4	2.1	8.4	1.7	1.7	1.6	.9
9			1.7	1.7	2.1	8.4	2.0	6.3	1.6	.9	1.7	1.7
10			1.8	2.9	2.0	6.3	2.0	6.3	1.6	.9	1.6	.9
11			1.8	2.9			2.0	6.3	1.5	.4	1.6	.9
12			1.7	1.7			1.9	4.4	1.5	.4	1.5	.4
13			1.7	1.7			1.8	2.9	1.5	.4	1.5	.4
14			1.6	.9			1.8	2.9	1.5	.4	1.5	.4
15			1.6	.9			1.8	2.9	1.5	.4	1.5	.4
16			1.6	.9			1.7	1.7	1.7	1.7	1.4	.1
17			1.6	.9			1.7	1.7	1.8	2.9	1.4	.1
18			1.6	.9			1.7	1.7	1.7	1.7	1.5	.4
19			1.6	.9			1.7	1.7	1.7	1.7	1.5	.4
20			1.6	.9			1.9	4.4	1.6	.9	1.5	.4
21			1.6	.9			1.9	4.4	1.6	.9	1.5	.4
22			1.6	.9			1.9	4.4	1.6	.9	1.5	.4
23			1.5	.4			2.0	6.3	1.6	.9	1.4	.1
24			1.5	.4			2.0	6.3	1.6	.9	1.4	.1
25			1.5	.4			1.8	2.9	1.5	.4	1.4	.1
26			1.5	.4			1.7	1.7	1.5	.4	1.5	.4
27			1.5	.4			2.0	6.3	1.5	.4	1.5	.4
28			1.5	.4			2.0	6.3	1.5	.4	1.5	.4
29							2.1	8.4	1.5	.4	1.5	.4
30	4.6	108					1.9	4.4	1.5	.4	1.5	.4
31	7.7	263							1.4	.1		

NOTE.—Channel dry when gage was installed Dec. 15, 1910, and probably remained so until last of January. No gage record obtained Mar. 11 to Apr. 4. Discharge determined from a rating curve which is not well defined. Curve has been extended to obtain approximate estimates for the high water at end of January.

Monthly discharge of Louse Creek near Wickahoney, Idaho, for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
February	68	0.4	4.41	245	D.
March 1-10	163	.4	34.7	688	D.
April 5-30	14.7	1.7	5.26	271	C.
May	6.3	.1	1.32	81.2	C.
June	1.7	.1	.53	31.5	C.

CASTLE CREEK NEAR CASTLE CREEK, IDAHO.

Location.—In sec. 21, T. 5 S., R. 1 E. Boise meridian, at the Toy ranch, 3 miles above Castle Creek post office.

Records available.—September 22, 1910, to December 31, 1911, when station was discontinued.

Drainage area.—Not measured.

Gage.—Vertical staff on right side of rating flume, which is just above the point of crossing of the road leading to the ranch house.

Channel.—Timber-lined rating flume previously installed by private parties.

Discharge measurements.—Made from planks across the flume or by wading.

Diversions.—Above most of the diversions on Castle Creek. There is a dam site in the canyon a short distance above the station.

Accuracy.—Rating curve well defined by measurements; records good.

Cooperation.—Gage heights furnished by private company interested in reservoir site.

Discharge measurements of Castle Creek near Castle Creek, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-feet.*
Nov. 15	Lynn Crandall	0.17	1.5	Feb. 5	Lynn Crandall	.44	22.8
1911.				5	.....do	.52	31.5
Feb. 4	.....do	.38	15.4	Mar. 31	A. B. Purton	1.0	113

Daily gage height, in feet, of Castle Creek near Castle Creek, Idaho, for the year ending Sept. 30, 1911.

[Mrs. E. J. Toy, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.10	0.25	0.30	0.20	0.80	0.30	1.10	0.65	0.58	0.20	0.05	0.03
2	.10	.25	.30	.20	.55	.40	1.10	.65	.52	.20	.05	.02
3	.10	.25	.30	.20	.45	.30	1.10	.65	.50	.20	.05	.03
4	.10	.25	.30	.20	.40	.40	1.10	.60	.45	.15	.05	.02
5	.10	.18	.30	.30	.45	.55	1.10	.60	.40	.15	.05	.03
6	.10	.18	.30	.30	.45	.40	1.10	.70	.40	.10	.10	.02
7	.10	.18	.30	.30	.42	.50	.90	.65	.40	.10	.10	.03
8	.10	.18	.30	.25	.40	.45	.90	.60	.40	.10	.05	.02
9	.10	.18	.30	.25	.30	.45	.95	.60	.38	.10	.05	.03
10	.10	.18	.30	.25	.40	.52	.95	.60	.35	.08	.05	.02
11	.10	.18	.30	.25	.40	.50	.90	.60	.35	.08	.02	.03
12	.15	.18	.35	.20	.40	.45	.90	.60	.30	.08	.02	.02
13	.25	.18	.35	.20	.35	.40	.90	.60	.30	.08	.02	.03
14	.25	.18	.35	.20	.30	.50	.80	.55	.30	.08	.02	.02
15	.25	.18	.35	.20	.30	.40	.70	.60	.30	.08	.02	.03
16	.25	.18	.35	.20	.20	.80	.70	.70	.30	.08	.02	.02
17	.25	.18	.35	.15	.25	.65	.70	.70	.30	.05	.02	.03
18	.25	.18	.35	.15	.35	.70	.70	.60	.25	.05	.02	.02
19	.25	.18	.35	.40	.35	.70	.65	.60	.20	.12	.02	.03
20	.25	.18	.30	.42	.30	.80	.65	.60	.20	.20	.03	.02
21	.25	.18	.30	.20	.30	.90	.65	.55	.15	.10	.03	.03
22	.25	.18	.30	.20	.30	.85	.60	.55	.15	.05	.03	.02
23	.25	.20	.30	.15	.35	1.00	.60	.50	.15	.05	.03	.03
24	.25	.20	.30	.20	.40	1.20	.60	.50	.15	.05	.03	.02
25	.25	.20	.30	.50	.30	1.05	.60	.50	.15	.05	.03	.05
26	.25	.20	.30	.45	.30	.80	.60	.50	.15	.05	.03	.05
27	.25	.25	.25	.30	.30	.80	.80	.50	.20	.05	.03	.05
28	.25	.30	.25	.30	.35	.75	.75	.50	.25	.05	.03	.05
29	.25	.30	.20	.28	....	.85	.70	.50	.42	.05	.02	.05
30	.25	.30	.20	.50	....	1.10	.65	.45	.25	.05	.03	.05
31	.25	....	.20	1.00	....	1.05	....	.40	....	.05	.02	....

NOTE.—Gage heights probably not affected by ice.

Daily discharge, in second-feet, of Castle Creek near Castle Creek, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.5	4.7	8.0	2.5	77	8.0	132	52	41	2.5	0.2	.2
2	.5	4.7	8.0	2.5	37	17.5	132	52	33	2.5	.2	.1
3	.5	4.7	8.0	2.5	23.8	8.0	132	52	30.0	2.5	.2	.2
4	.5	4.7	8.0	2.5	17.5	17.5	132	44	23.8	1.1	.2	.1
5	.5	1.9	8.0	8.0	23.8	37	132	44	17.5	1.1	.2	.2
6	.5	1.9	8.0	8.0	23.8	17.5	132	60	17.5	.5	.5	.1
7	.5	1.9	8.0	8.0	20.0	30.0	95	52	17.5	.5	.5	.2
8	.5	1.9	8.0	4.7	17.5	23.8	95	44	17.5	.5	.2	.1
9	.5	1.9	8.0	4.7	8.0	23.8	104	44	15.6	.5	.2	.2
10	.5	1.9	8.0	4.7	17.5	33	104	44	12.8	.4	.2	.1
11	.5	1.9	8.0	4.7	17.5	30.0	95	44	12.8	.4	.1	.2
12	1.1	1.9	12.8	2.5	17.5	23.8	95	44	8.0	.4	.1	.1
13	4.7	1.9	12.8	2.5	12.8	17.5	95	44	8.0	.4	.1	.2
14	4.7	1.9	12.8	2.5	8.0	30.0	77	37	8.0	.4	.1	.1
15	4.7	1.9	12.8	2.5	8.0	17.5	60	44	8.0	.4	.1	.2
16	4.7	1.9	12.8	2.5	2.5	77	60	60	8.0	.4	.1	.1
17	4.7	1.9	12.8	1.1	4.7	52	60	60	8.0	.2	.1	.2
18	4.7	1.9	12.8	1.1	12.8	60	60	44	4.7	.2	.1	.1
19	4.7	1.9	12.8	17.5	12.8	60	52	44	2.5	.7	.1	.2
20	4.7	1.9	8.0	20.0	8.0	77	52	44	2.5	2.5	.2	.1
21	4.7	1.9	8.0	2.5	8.0	95	52	37	1.1	.5	.2	.2
22	4.7	1.9	8.0	2.5	8.0	86	44	37	1.1	.2	.2	.1
23	4.7	2.5	8.0	1.1	12.8	113	44	30.0	1.1	.2	.2	.2
24	4.7	2.5	8.0	2.5	17.5	151	44	30.0	1.1	.2	.2	.1
25	4.7	2.5	8.0	30.0	8.0	122	44	30.0	1.1	.2	.2	.2
26	4.7	2.5	8.0	23.8	8.0	77	44	30.0	1.1	.2	.2	.2
27	4.7	4.7	4.7	8.0	8.0	77	77	30.0	2.5	.2	.2	.2
28	4.7	8.0	4.7	8.0	12.8	68	68	30.0	4.7	.2	.2	.2
29	4.7	8.0	2.5	6.7	....	86	60	30.0	20.0	.2	.1	.2
30	4.7	8.0	2.5	30.0	....	132	52	23.8	4.7	.2	.2	.2
31	4.7	....	2.5	113	....	122	....	17.5	....	.2	.1	....

NOTE.—Discharge determined from a rating curve well defined above 8.0 second-feet.

Daily gage height, in feet, and discharge, in second-feet, of Castle Creek near Castle Creek, Idaho, for Oct. 1 to Dec. 31, 1911.

[Mrs. E. J. Toy, observer.]

Day.	October.		November.		December.		Day.	October.		November.		December.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.		Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1....	0.05	0.2	0.17	1.7	0.18	1.9	16....	0.15	1.1	0.20	2.5	.17	1.7
2....	.05	.2	.18	1.9	.17	1.7	17....	.18	1.9	.20	2.5	.20	2.5
3....	.05	.2	.17	1.7	.18	1.9	18....	.17	1.7	.20	2.5	.20	2.5
4....	.05	.2	.18	1.9	.17	1.7	19....	.18	1.9	.20	2.5	.20	2.5
5....	.05	.2	.20	2.5	.18	1.9	20....	.17	1.7	.20	2.5	.20	2.5
6....	.05	.2	.20	2.5	.17	1.7	21....	.18	1.9	.20	2.5	.20	2.5
7....	.05	.2	.20	2.5	.18	1.9	22....	.17	1.7	.20	2.5	.20	2.5
8....	.05	.2	.20	2.5	.17	1.7	23....	.18	1.9	.18	1.9	.20	2.5
9....	.08	.4	.20	2.5	.18	1.9	24....	.17	1.7	.18	1.9	.08	.4
10....	.10	.5	.20	2.5	.17	1.7	25....	.18	1.9	.17	1.7	.07	.3
11....	.15	1.1	.20	2.5	.18	1.9	26....	.17	1.7	.17	1.7	.08	.4
12....	.15	1.1	.20	2.5	.17	1.7	27....	.18	1.9	.18	1.9	.07	.3
13....	.15	1.1	.20	2.5	.18	1.9	28....	.17	1.7	.17	1.7	.08	.4
14....	.15	1.1	.20	2.5	.17	1.7	29....	.18	1.9	.18	1.9	.07	.3
15....	.15	1.1	.20	2.5	.18	1.9	30....	.18	1.9	.17	1.7	.08	.4
							31....	.17	1.7	......	......	.07	.3

NOTE.—See footnote to tables for year ending Sept. 30, 1911.

Monthly discharge of Castle Creek near Castle Creek, Idaho, for 1910–11.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1910–11.					
October	4.7	0.5	3.09	190	B.
November	8.0	1.9	3.06	182	B.
December	12.8	2.5	8.49	522	A.
January	113	1.1	10.7	658	A.
February	77	2.5	16.2	900	A.
March	151	8.0	57.7	3,550	A.
April	132	44	80.8	4,810	A.
May	60	17.5	41.2	2,530	A.
June	41	1.1	11.2	666	A.
July	2.5	.2	.67	41.2	B.
August	.5	.1	.18	11.1	C.
September	.2	.1	.16	9.52	C.
The year	151	.1	19.2	14,100	
1911.					
October	1.9	.2	1.17	71.9	C.
November	2.5	1.7	2.22	132	B.
December	2.5	.3	1.58	97.2	B.
The period	....	....	....	301	

OWYHEE RIVER AT OWYHEE, OREG.

Location.—In sec. 2, T. 21 S., R. 46 E. Willamette meridian, at the county bridge about half a mile from Owyhee post office, 3 miles above the mouth of the river, and about 10 miles southwest of Nyssa, Oreg.

Records available.—March 26, 1890, to December 31, 1893; January 1, 1895 to May 15, 1897, and August 27, 1903, to September 30, 1911.

Drainage area.—11,100 square miles. Area approximate and should be used with caution. Watershed not well defined on available maps.

Gage.—Chain gage on upstream side of highway bridge.

Channel.—Bed of cemented gravel; fairly permanent; one channel only.

Discharge measurements.—Made from highway bridge and by wading.

Diversions.—The Owyhee canal diverts water from left bank about 6 miles above the station. Practically all the normal low-water flow is taken; maximum diversion by this canal approximately 250 second-feet.

Winter flow.—Gage heights affected for short periods by ice, but not seriously.

Accuracy.—Conditions unfavorable for accurate measurements at very low stages; higher stage records, of paramount interest at this station, probably reliable.

Discharge measurements of Owyhee River at Owyhee, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 1	O. W. Hartwell........	2.38	67.5	June 19	O. W. Hartwell	3.67	760
Nov. 22	Lynn Crandall.........	2.68	255	July 2	Do..................	3.09	375
				Sept. 14	Lynn Crandall	2.06	5.1

Daily gage height, in feet, of Owyhee River at Owyhee, Oreg., for the year ending Sept. 30, 1911.

[Gilder Watson, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.4	....	2.85	3.05	4.05	3.4	7.05	6.05	4.55	3.05	2.05	2.05
2	2.4	....	2.9	3.05	3.65	3.45	7.25	5.65	4.45	3.05	2.05	2.05
3	2.4	....	2.9	3.15	3.55	3.45	7.55	5.35	4.35	3.05	2.05	2.05
4	2.4	....	2.9	3.25	3.55	3.5	7.85	5.35	4.35	3.05	2.05	2.05
5	2.4	....	2.9	3.25	3.55	4.05	8.05	5.05	4.25	3.05	2.05	2.05
6	2.4	....	2.9	3.25	3.45	6.2	8.15	5.25	4.25	3.05	2.05	2.05
7	2.4	....	2.95	3.2	3.5	7.75	7.85	5.15	4.25	2.95	2.05	2.05
8	2.4	....	2.95	3.2	3.45	8.9	7.55	5.45	4.25	2.95	2.05	2.05
9	2.4	....	2.95	3.15	3.4	8.05	7.35	5.35	4.35	2.95	2.05	2.05
10	2.4	....	3.0	3.05	3.35	7.55	7.05	5.05	4.35	2.85	1.95	2.05
11	2.4	....	3.0	3.05	3.45	7.05	6.55	5.05	4.35	2.85	1.95	2.05
12	2.4	....	3.1	3.05	3.5	6.95	6.15	4.95	4.35	2.75	1.95	2.05
13	2.4	....	5.6	3.05	3.45	6.85	5.95	4.85	4.25	2.65	2.05	2.05
14	2.4	....	5.4	3.05	3.45	6.75	5.65	4.75	4.15	2.55	2.05	2.05
15	2.4	....	5.0	3.05	3.45	6.75	5.35	4.65	4.05	2.45	2.05	2.05
16	2.4	....	4.7	3.05	3.45	6.65	5.25	4.95	3.95	2.35	2.05	2.15
17	2.4	....	4.5	3.05	3.45	6.55	5.15	5.45	3.85	2.35	2.05	2.15
18	2.4	....	4.45	3.1	3.5	6.45	5.05	6.55	3.75	2.35	2.05	2.15
19	2.4	....	4.45	3.1	3.45	6.35	5.05	5.85	3.75	2.25	2.05	2.15
20	2.4	....	4.35	3.05	3.45	6.45	5.15	5.65	3.75	2.25	2.05	2.15
21	2.4	....	4.3	3.05	3.4	6.95	5.05	5.35	3.75	2.25	2.05	2.15
22	2.4	2.7	4.2	3.1	3.4	7.15	4.95	5.25	3.65	2.25	2.05	2.15
23	2.4	2.7	4.15	3.15	3.4	7.45	4.85	5.05	3.65	2.25	2.05	2.15
24	....	2.7	3.0	3.15	3.35	8.05	5.05	4.95	3.65	2.25	2.05	2.15
25	....	2.7	3.0	4.05	3.35	8.9	5.15	4.95	3.75	2.25	2.05	2.15
26	....	2.75	3.05	7.0	3.35	8.95	5.25	4.75	3.85	2.25	2.05	2.15
27	....	2.8	3.05	9.9	3.35	8.85	5.05	4.75	4.05	2.25	2.05	2.15
28	....	2.85	3.0	9.25	3.4	8.65	5.35	4.75	3.55	2.05	2.05	2.15
29	....	2.85	3.0	9.1	....	8.45	5.75	4.65	3.15	2.05	2.05	2.15
30	....	2.85	3.0	6.85	....	7.05	5.95	4.55	3.05	2.05	2.05	2.15
31	....	....	3.0	5.45	....	6.95	....	4.65	....	2.05	2.05	....

NOTE.—Gage chain stolen Oct. 24 and replaced Nov. 22. No readings obtained in the meantime. Gage height probably not seriously affected by ice.

Daily discharge, in second-feet, of Owyhee River at Owyhee, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	95	....	270	380	1,080	575	5,780	3,680	1,560	350	5	5
2	95	....	295	380	752	610	6,300	3,020	1,460	350	5	5
3	95	....	295	442	680	610	7,140	2,580	1,360	350	5	5
4	95	....	295	508	680	645	8,050	2,580	1,360	350	5	5
5	95	....	295	508	680	1,080	8,700	2,160	1,260	350	5	5
6	95	....	295	508	610	3,940	9,020	2,440	1,260	350	5	5
7	95	....	322	475	645	7,740	8,050	2,300	1,260	290	5	5
8	95	....	322	475	610	11,600	7,140	2,720	1,260	290	5	5
9	95	....	322	442	575	8,700	6,570	2,580	1,360	290	5	5
10	95	....	350	380	542	7,140	5,780	2,160	1,360	232	2	5
11	95	....	350	380	610	5,780	4,620	2,160	1,360	232	2	5
12	95	....	410	380	645	5,530	3,860	2,040	1,360	181	2	5
13	95	....	3,210	380	610	5,300	3,500	1,920	1,260	136	5	5
14	95	....	2,860	380	610	5,060	3,020	1,800	1,160	97	5	5
15	95	....	2,240	380	610	5,060	2,580	1,680	1,080	64	5	5
16	95	....	1,830	380	610	4,840	2,440	2,040	990	38	5	10
17	95	....	1,590	380	610	4,620	2,300	2,720	905	38	5	10
18	95	....	1,540	410	645	4,420	2,160	4,620	828	38	5	10
19	95	....	1,540	410	610	4,220	2,160	3,340	828	20	5	10
20	95	....	1,420	380	610	4,420	2,300	3,020	828	20	5	10
21	95	....	1,370	380	575	5,530	2,160	2,580	828	20	5	10
22	95	200	1,270	410	575	6,030	2,040	2,440	752	20	5	10
23	95	200	1,220	442	575	6,850	1,920	2,160	752	20	5	10
24	....	200	350	442	542	8,700	2,160	2,040	752	20	5	10
25	....	200	350	1,120	542	11,600	2,300	2,040	828	20	5	10
26	....	222	380	6,160	542	11,800	2,440	1,800	905	20	5	10
27	....	245	380	14,200	542	11,500	2,160	1,800	1,080	20	5	10
28	....	270	350	12,300	575	10,700	2,580	1,800	680	5	5	10
29	....	270	350	11,900	....	10,000	3,180	1,680	412	5	5	10
30	....	270	350	5,300	....	5,780	3,500	1,560	350	5	5	10
31	....	....	350	2,720	....	5,530	....	1,680	....	5	5	....

NOTE.—Discharge Oct. 1 to Jan. 29 determined from a curve well defined between 500 and 15,000 second-feet and fairly well defined below 500 second-feet. Mean discharge October and November estimated. Discharge Jan. 30 to Sept. 30 determined from a well-defined rating curve.

Monthly discharge of Owyhee River at Owyhee, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	....	....	[a] 100	6,150	C.
November	....	....	[a] 180	10,700	C.
December	3,210	270	864	53,100	B.
January	14,200	380	2,060	127,000	B.
February	1,080	542	625	34,700	B.
March	11,800	575	6,000	369,000	A.
April	9,020	1,920	4,200	250,000	A.
May	4,620	1,560	2,360	145,000	A.
June	1,560	350	1,050	62,500	A.
July	350	5	136	8,360	B.
August	5	2	4.71	290	C.
September	10	5	7.50	446	B.
The year	14,200	2	1,470	1,070,000	

[a] Estimated.

JORDAN CREEK NEAR JORDAN VALLEY, OREG.

Location.—In sec. 9, T. 30 S., R. 45 E. Willamette meridian, near the upper end of the canyon which begins at the lower end of Jordan Valley, and about 9 miles below Jordan Valley post office; above mouth of Cow Creek.

Records available.—April 28 to September 30, 1911.

Drainage area.—Not measured.

Gage.—Inclined staff on right bank.

Channel.—Lava rock bed and control; should be permanent; one channel at all stages.

Discharge measurements.—Made from a cable or by wading.

Diversions.—Practically the entire summer flow is diverted for use in the valley above the station.

Winter flow.—Gage heights probably not seriously affected by ice.

Accuracy.—Rating curve well defined; records should be good.

Cooperation.—Maintained in cooperation with the Jordan Valley Irrigation Co.

The following discharge measurement was made by Lynn Crandall, July 18, 1911: Gage height, 2.54 feet; discharge 12.0 second-feet.

Daily gage height, in feet, and discharge, in second-feet, of Jordan Creek near Jordan Valley, Oreg., for the year ending Sept. 30, 1911.

[Marcus Rentura, observer.]

Day.	April.		May.		June.		July.		August.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1				828	6.7	774				
2			6.9	846	6.8	810				
3			6.8	810	6.7	774				
4			6.8	810	6.6	739				
5			7.3	1,000	6.6	739				
6				1,100	6.4	670				
7				1,100		636				
8			7.8	1,200	6.2	603				
9			7.5	1,080	6.1	571				
10			6.9	846	6.0	540				
11			7.6	1,120	5.7	450				
12			6.8	810	5.5	395			1.5	0
13			6.2	603		499				
14			6.4	670	6.2	603				
15			6.8	810		439				
16			7.2	960	5.0	275				
17				960		264				
18				960	4.9	254	2.54	12		
19			7.2	960	4.7	215				
20				1,040	4.6	197				
21				1,040	4.5	180				
22			7.6	1,120	4.3	149				
23				1,080	4.2	135				
24			7.4	1,040	4.0	110				
25				1,040		105				
26			7.4	1,040		100				
27				1,000		95				
28	7.5	1,080	7.2	960		90				
29	7.0	883		922		85	1.9	2		
30	6.8	810	7.0	883		80				
31				828						

NOTE.—No gage heights recorded after Aug. 12; probably no flow after that date. Discharge for other days determined from a rating curve based on measurements in 1911 and 1912, and well defined between 10 and 2,000 second-feet. Discharge interpolated for days during May and June for which gage heights are missing. Mean discharge July and August estimated by interpolating discharges between the days of record.

Monthly discharge of Jordan Creek near Jordan Valley, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
May	1,200	603	951	58,500	B.
June	810	80	386	23,000	B.
July			27	1,660	D.
August			.45	28	D.
September			.00	0	
The period				83,200	

NOTE.—See footnote to table of daily gage heights and discharge.

BOISE RIVER NEAR TWIN SPRINGS, IDAHO.

Location.—On unsurveyed land, approximately sec. 23, T. 4 N., R. 6 E. Boise meridian, about 1½ miles above the flow line of the Arrow Rock reservoir, 4 miles below Twin Springs, 18 miles above Arrowrock, and 38 miles from Boise, on the Boise to Twin Springs stage road; about one-fourth mile above Roy Call's ranch house, at the mouth of Birch Creek; below the mouth of North Fork and above South Fork, the only other tributary of any size between the station and Arrowrock dam.

Records available.—March 21 to September 30, 1911.

Drainage area.—830 square miles.

Gage.—Inclined staff on right bank. Datum unchanged.

Channel.—Gravel and bowlders, probably permanent.

Discharge measurements.—Made from a cable about 50 feet upstream from the gage.

Diversions.—No diversions above the station and none between it and the dam.

Accuracy.—Rating curve well defined; records good.

Cooperation.—Expense of maintaining this station is borne by the United States Reclamation Service.

Discharge measurements of Boise River near Twin Springs, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 21	A. B. Purton	3.38	1,480	July 17	O. W. Hartwell	3.54	1,800
May 11	.....do	4.50	3,120	18	.....do	3.36	1,570
June 12	.....do	6.6	6,540	Aug. 22	Lynn Crandall	2.18	452

Daily gage height, in feet, of Boise River near Twin Springs, Idaho, for the year ending Sept. 30, 1911.

[Roy Call, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	4.0	4.2	....	....	2.5	2.1
2	....	4.2	4.3	5.5	....	2.5	2.0
3	....	4.0	4.5	6.0	....	2.5	2.0
4	....	3.8	4.9	6.2	....	2.5	2.0
5	....	3.4	5.4	5.9	....	2.4	2.0
6	....	3.3	5.3	5.6	....	2.4	2.1
7	....	3.2	5.1	6.1	4.3	2.4	2.1
8	....	3.2	5.0	6.5	4.3	2.3	2.2
9	....	3.3	5.0	6.1	4.0	2.3	2.2
10	....	3.1	4.5	5.5	3.9	2.3	2.1
11	....	3.0	4.5	6.5	3.8	2.2	2.1
12	....	3.1	4.4	6.9	3.7	2.2	2.1
13	....	3.0	4.5	7.2	3.5	2.2	2.0
14	....	3.0	4.4	6.7	3.5	2.2	2.0
15	....	2.9	4.8	6.6	3.5	....	2.1
16	....	2.9	5.2	6.6	3.6	....	2.1
17	....	3.0	5.2	6.3	3.54	....	2.1
18	....	3.2	5.2	6.3	3.4	....	2.1
19	....	3.2	5.1	6.5	3.3	....	2.1
20	....	3.2	4.9	6.4	3.2	....	2.1
21	3.4	3.1	4.6	6.1	3.2	....	2.1
22	3.5	3.2	4.8	6.0	3.0	2.18	2.0
23	3.6	3.4	5.1	6.0	3.0	2.1	2.0
24	3.5	3.7	5.1	5.3	3.0	2.1	2.0
25	3.2	4.2	5.1	4.9	2.9	2.1	2.0
26	3.1	4.5	4.9	4.8	2.9	2.1	2.0
27	3.0	4.7	4.6	5.0	2.8	2.1	2.0
28	2.9	4.7	4.5	4.8	2.8	2.1	2.1
29	3.0	4.3	4.5	4.7	2.8	2.1	2.1
30	3.2	4.1	4.6	4.5	2.7	2.1	2.0
31	3.5	....	....	....	2.6	2.1	....

Daily discharge, in second-feet, of Boise River near Twin Springs, Idaho, for the year ending Sept. 30, 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	2,380	2,670	4,230	2,520	680	410
2	....	2,670	2,820	4,710	2,250	680	355
3	....	2,380	3,120	5.520	2,360	680	355
4	....	2,100	3,750	5,860	2,550	680	355
5	....	1,580	4,550	5,350	2,790	605	355
6	....	1,460	4,390	4.870	2.820	605	410
7	....	1,340	4.070	5,690	2,820	605	410
8	....	1,340	3,910	6,370	2,820	535	470
9	....	1,460	3,910	5,690	2,380	535	470
10	....	1,240	3,120	4,710	2,240	535	410
11	....	1,130	3,120	6,370	2,100	470	410
12	....	1,240	2,970	7,050	1,960	470	410
13	....	1,130	3,120	7.560	1,700	470	355
14	....	1,130	2,970	6.710	1,700	470	355
15	....	1,030	3,590	6,540	1,700	470	410
16	....	1,030	4,230	6.540	1,830	470	410
17	....	1,130	4,230	6.030	1,750	468	410
18	....	1,340	4,230	6.030	1,580	466	410
19	....	1,340	4,070	6,370	1,460	464	410
20	....	1,340	3,750	6,200	1,340	462	410
21	1,580	1,240	3,270	5,690	1,340	460	410
22	1,700	1,340	3,590	5,520	1,130	458	355
23	1,830	1,580	4,070	5,520	1,130	410	355
24	1,700	1,960	4,070	4,390	1,130	410	355
25	1,340	2,670	4,070	3,750	1,030	410	355
26	1,240	3,120	3,750	3,590	1,030	410	355
27	1,130	3,430	3,270	3.910	935	410	355
28	1,030	3,430	3,120	3,590	935	410	410
29	1,130	2,820	3,120	3,430	935	410	410
30	1,340	2,520	3,270	3,120	845	410	355
31	1,700	....	3,750	....	760	410	....

NOTE.—Discharge determined from a well-defined rating curve. Discharge July 1 to 6 estimated. Other missing days interpolated.

Monthly discharge of Boise River near Twin Springs, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
March 21-31	1,830	1,080	1,430	1.72	0.70	31,200	A.
April	3,430	1,030	1,800	2.17	2.42	107,000	A.
May	4,550	2,670	3,610	4.35	5.02	222,000	A.
June	7,560	3,120	5,360	6.46	7.22	319,000	A.
July	2,820	760	1,740	2.10	2.42	107,000	A.
August	680	410	498	.600	.69	30,600	A.
September	470	355	390	.470	.52	23,200	A.
The period						840,000	

BOISE RIVER AT DOWLING'S RANCH, NEAR ARROWROCK, IDAHO.

Location.—In sec. 15, T. 3 N., R. 4 E. Boise meridian, at Dowling's ranch on the Boise & Arrowrock Railroad, 2 miles below the Highland power dam, 4 miles below Arrowrock, three-fourths mile above Moores Creek, about 4 miles above the Highland gaging station, and about 16 miles from Boise; below all main tributaries of the Boise except Moores Creek.

Records available.—March 12 to September 30, 1911.

Drainage area.—2,230 square miles.

Gage.—Sloping staff on left bank, 200 or 300 yards above the ford.

Channel.—Gravel and medium-sized cobbles; probably permanent.

Discharge measurements.—Made from a cable about 50 feet below the gage.

Diversions.—No diversions between Arrowrock dam and the station. All low-water flow is diverted below during the irrigating season.

Accuracy.—Rating curve well defined; relation between gage height and discharge not affected by ice to any extent; records good.

Cooperation.—Expense of maintenance borne by the United States Reclamation Service.

Discharge measurements of Boise River at Dowling's ranch, near Arrowrock, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1911.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Mar. 16	A. B. Purton	3.88	1,570	June 6	A. C. Price	7.55	11,200
26	.....do	4.50	2,460	11	A. B. Purton	7.40	10,200
28	.....do	4.31	2,300	14	A. C. Price	8.40	14,000
May 9	.....do	6.60	7,800	15	A. B. Purton	8.42	14,300
13	.....do	6.37	7,190	July 14	O. W. Hartwell	4.90	3,300
26	.....do	6.66	7,560	19	.....do	4.54	2,830
27	.....do	6.49	7,280	Aug. 21	Lynn Crandall	3.15	943

Daily gage height, in feet, of Boise River at Dowling's ranch, near Arrowrock, Idaho, for the year ending Sept. 30, 1911.

[Andrew Dowling, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	5.6	6.0	7.2	6.0	3.7	3.0
2	....	5.8	6.1	7.5	5.7	3.7	3.0
3	....	5.7	6.4	7.8	5.7	3.6	3.0
4	....	5.6	6.7	8.0	5.8	3.6	3.0
5	....	5.3	7.4	7.9	6.0	3.5	3.1
6	....	5.1	7.5	7.7	5.9	3.5	3.1
7	....	4.9	7.1	7.7	5.9	3.5	3.1
8	....	4.8	7.0	8.2	5.7	3.5	3.1
9	....	4.9	6.8	7.8	5.4	3.4	3.0
10	....	5.0	6.4	7.4	5.2	3.4	3.0
11	....	4.9	6.4	7.5	5.1	3.4	3.0
12	3.5	4.7	6.4	8.4	5.0	3.4	3.0
13	3.6	4.5	6.5	8.7	5.0	3.3	3.0
14	3.6	4.4	6.4	8.4	5.0	3.3	3.0
15	3.7	4.4	6.8	8.5	5.0	3.3	3.0
16	3.9	4.4	7.1	8.4	4.9	3.3	3.0
17	4.0	4.5	7.0	8.3	4.8	3.2	3.0
18	4.1	4.7	7.0	8.2	4.7	3.2	3.0
19	4.3	4.8	6.9	8.3	4.6	3.2	3.0
20	4.5	4.8	6.6	8.3	4.4	3.2	3.0
21	4.7	4.7	6.5	7.9	4.4	3.2	3.0
22	4.9	4.8	6.7	7.8	4.3	3.2	3.0
23	5.1	5.0	6.9	7.8	4.2	3.1	3.0
24	5.0	5.4	7.0	7.3	4.1	3.1	3.0
25	4.8	5.9	7.0	6.6	4.0	3.1	3.0
26	4.5	6.4	6.7	6.5	4.0	3.1	3.0
27	4.4	6.6	6.5	6.4	4.0	3.1	3.0
28	4.3	6.6	6.4	6.7	3.9	3.1	3.0
29	4.3	6.3	6.2	6.6	3.8	3.1	3.1
30	4.7	6.1	6.4	6.3	3.8	3.1	3.1
31	5.2	....	6.8	....	3.7	3.0	....

Daily discharge, in second-feet, of Boise River at Dowling's ranch, near Arrowrock, Idaho, for the year ending Sept. 30, 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	4,860	5,920	9,740	5,920	1,470	810
2	....	5,370	6,200	10,800	5,110	1,470	810
3	....	5,110	7,100	11,800	5,110	1,360	810
4	....	4,860	8,060	12,600	5,370	1,360	810
5	....	4,160	10,400	12,200	5,920	1,260	890
6	....	3,720	10,800	11,500	5,640	1,260	890
7	....	3,300	9,400	11,500	5,640	1,260	890
8	....	3,100	9,060	13,300	5,110	1,260	890
9	....	3,300	8,390	11,800	4,390	1,160	810
10	....	3,510	7,100	10,400	3,940	1,160	810
11	....	3,300	7,100	10,800	3,720	1,160	810
12	1,260	2,910	7,100	14,000	3,510	1,160	810
13	1,360	2,560	7,420	15,100	3,510	1,060	810
14	1,360	2,400	7,100	14,000	3,510	1,060	810
15	1,470	2,400	8,390	14,400	3,510	1,060	810
16	1,710	2,400	9,400	14,000	3,300	1,060	810
17	1,840	2,560	9,060	13,600	3,100	975	810
18	1,970	2,910	9,060	13,300	2,910	975	810
19	2,250	3,100	8,720	13,600	2,730	975	810
20	2,560	3,100	7,740	13,600	2,400	975	810
21	2,910	2,910	7,420	12,200	2,400	975	810
22	3,300	3,100	8,060	11,800	2,250	975	810
23	3,720	3,510	8,720	11,800	2,110	890	810
24	3,510	4,390	9,060	10,100	1,970	890	810
25	3,100	5,640	9,060	7,740	1,840	890	810
26	2,560	7,100	8,060	7,420	1,840	890	810
27	2,400	7,740	7,420	7,100	[illegible],840	890	810
28	2,250	7,740	7,100	8,060	1,710	890	810
29	2,250	6,790	6,290	7,740	1,590	890	890
30	2,910	6,200	7,100	6,790	1,590	890	890
31	3,940	....	8,390	....	1,470	810	....

NOTE.—Discharge determined from a well-defined rating curve.

Monthly discharge of Boise River at Dowling's ranch, near Arrowrock, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
March 12-31	3,940	1,260	2,430	1.09	0.81	96,400	A.
April	7,740	2,400	4,140	1.86	2.08	246,000	A.
May	10,800	5,920	8,080	3.62	4.18	497,000	A.
June	15,100	6,790	11,400	5.11	5.71	678,000	A.
July	5,920	1,470	3,390	1.52	1.75	208,000	A.
August	1,470	810	1,080	.484	.56	66,400	A.
September	890	810	826	.370	.41	49,200	A.
The period	....	....	....	....	....	1,840,000	

BOISE RIVER NEAR HIGHLAND, IDAHO.

Location.—In sec. 32, T. 3 N., R. 4 E. Boise meridian, about one-fourth mile above Smythe's ranch and one-half mile below Kirk's ranch (the old Kunzi ranch). About 3 miles southwest of the old Highland post office and about 1 mile above Gooseneck, the nearest station on the Boise & Arrowrock Railroad; about 8 miles above the old station near Boise, which it replaced on July 27, 1905; 2½ miles below the mouth of Moores Creek and below all important tributaries.

Records available.—December 15, 1894, to October 31, 1904, at the old station; from March 18, 1905, to September 30, 1911, at the present station.

Drainage area.—2,650 square miles.

Gage.—March 18 to July 31, 1905, gage heights obtained from a temporary gage on the right bank below Smythe's house; from August 1, 1905, to November 21, 1909, a sloping gage on the right bank about one-fourth mile above Smythe's house at different datum; from November 22, 1909, to September 30, 1911, a vertical staff gage on left bank and about 50 feet farther upstream. Reads the same as gage across river at low stages but differs at high stages.

Channel.—Rough, with bowlders and gravel. Control changes during high water, filling in and cutting out, but seems to return to a condition of equilibrium after each high-water stage.

Discharge measurements.—Made from a cable about 100 feet above the present gage.

Diversions.—Practically no water is diverted above the station. Low-water flow is all diverted farther down during the irrigating season.

Accuracy.—Enough measurements have been made to insure a reliable record even for periods of shifting channel. Relation between gage height and discharge is somewhat affected by ice.

Cooperation.—Some of the discharge measurements have been furnished and the expense of maintaining this station has been borne by the United States Reclamation Service.

Discharge measurements of Boise River near Highland, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910		*Feet.*	*Sec.-ft.*	1911		*Feet.*	*Sec.-ft.*
Nov. 13	Lynn Crandall	4.52	1,590	May 25	A. B. Purton	10.05	9,260
1911				June 5	A. C. Price	10.85	13,100
Feb. 3	A. C. Price	4.70	1,650	15	A. B. Purton	11.6	14,800
Mar. 15	A. B. Purton	4.86	1,920	July 16	O. W. Hartwell	6.14	3,460
May 12	A. C. Price	9.75	7,560	17	A. C. Price	6.00	3,290
13	A. B. Purton	9.9	7,800	Aug. 21	Lynn Crandall	3.83	1,090

Daily gage height, in feet, of Boise River near Highland, Idaho, for the year ending Sept. 30, 1911.

[Mrs. Mary Kunzi, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	3.65	3.6	4.2	3.6	5.5	3.8	8.2	9.3	9.9	8.0	4.5	3.65
2	3.65	3.6	4.2	3.4	5.4	3.8	8.5	9.4	10.3	7.5	4.45	3.6
3	3.7	3.6	4.25	3.55	4.7	3.9	8.5	9.9	10.7	7.4	4.45	3.6
4	4.25	3.6	5.1	3.95	4.6	4.1	8.2	10.5	11.2	7.6	4.4	3.6
5	4.2	3.55	4.65	3.85	4.7	4.1	8.0	11.5	11.0	7.7	4.35	3.65
6	3.9	3.5	4.4	3.85	4.6	4.1	7.7	11.7	10.6	7.7	4.3	3.7
7	3.85	3.65	4.3	3.9	4.3	4.3	7.5	11.1	10.9	7.8	4.2	3.8
8	3.8	3.7	4.25	4.0	4.2	4.45	7.2	10.7	11.2	7.5	4.25	3.8
9	3.75	4.0	4.4	4.0	4.1	4.4	7.4	10.5	11.0	7.0	4.2	3.8
10	3.75	4.0	4.3	4.0	4.25	4.4	7.6	9.9	10.3	6.7	4.15	3.7
11	3.7	4.1	4.3	3.9	4.35	4.45	7.4	9.8	10.3	6.5	4.1	3.65
12	3.7	4.7	4.4	3.8	4.25	4.5	7.1	9.75	11.3	6.4	4.1	3.65
13	3.7	4.55	4.0	3.8	4.3	4.5	7.0	9.95	11.9	6.3	4.0	3.6
14	3.7	4.1	3.7	3.8	4.1	4.6	6.85	9.85	11.6	6.2	4.0	3.6
15	3.7	4.0	3.7	3.75	4.0	4.85	6.8	10.5	11.8	6.2	3.95	3.55
16	3.7	3.9	3.75	3.6	3.95	5.1	6.7	11.2	11.8	6.15	3.9	3.55
17	3.75	3.9	4.0	3.5	3.8	5.45	6.8	10.8	11.5	6.0	3.9	3.6
18	3.95	4.0	3.9	3.6	4.1	5.55	7.2	11.0	11.0	5.9	3.85	3.6
19	3.8	4.0	3.9	4.0	4.1	5.8	7.3	10.5	11.4	5.75	3.85	3.6
20	3.75	3.95	3.85	4.1	4.1	6.1	7.3	10.1	11.4	5.55	3.85	3.65
21	3.75	4.25	3.9	3.5	3.95	6.5	7.2	9.9	11.0	5.45	3.8	3.65
22	3.7	4.55	4.0	3.3	3.9	6.7	7.25	10.1	10.7	5.3	3.8	3.65
23	3.7	4.8	4.0	3.3	4.0	7.1	7.5	10.2	10.6	5.2	3.8	3.65
24	3.7	4.7	4.2	3.2	3.95	7.1	8.0	10.35	10.0	5.1	3.8	3.65
25	3.65	4.6	3.9	3.8	4.0	6.8	8.8	10.2	9.0	5.0	3.75	3.65
26	3.65	4.3	3.7	3.65	4.0	6.45	9.9	9.8	8.6	4.95	3.75	3.65
27	3.65	3.9	3.7	3.8	3.95	6.25	10.1	9.4	8.3	4.9	3.7	3.65
28	3.6	4.1	3.8	4.0	3.8	6.2	10.0	9.0	9.0	4.8	3.7	3.65
29	3.6	4.2	3.9	4.1	......	6.3	9.6	8.5	8.6	4.7	3.7	3.65
30	3.6	4.2	3.9	4.25	......	6.9	9.4	9.0	8.4	4.65	3.7	3.7
31	3.6	......	4.0	5.2	......	7.6	......	9.4	......	4.6	3.65	......

NOTE.—Gage heights probably not seriously affected by ice.

Daily discharge, in second-feet, of Boise River near Highland, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	965	940	1,300	940	2,600	1,040	6,150	7,120	10,600	7,230	1,580	993
2	965	940	1,300	850	2,480	1,040	6,560	7,250	11,500	6,360	1,540	969
3	990	940	1,340	915	1,730	1,100	6,550	8,020	12,400	6,100	1,540	969
4	1,340	940	2,140	1,130	1,640	1,230	6,100	8,950	13,400	6,300	1,500	969
5	1,300	915	1,680	1,070	1,730	1,230	5,750	10,500	13,400	6,350	1,460	993
6	1,100	890	1,460	1,070	1,640	1,230	5,280	10,800	12,800	6,240	1,410	1,020
7	1,070	965	1,380	1,100	1,380	1,380	4,970	9,830	13,300	6,280	1,340	1,070
8	1,040	990	1,340	1,160	1,300	1,500	4,520	9,170	13,800	5,720	1,370	1,070
9	1,020	1,160	1,460	1,160	1,230	1,460	4,790	8,330	13,500	4,880	1,340	1,070
10	1,020	1,160	1,310	1,160	1,340	1,460	5,050	7,820	12,400	4,370	1,300	1,020
11	990	1,230	1,380	1,100	1,420	1,500	4,750	7,650	12,500	3,950	1,260	993
12	990	1,730	1,460	1,040	1,340	1,550	4,280	7,560	14,100	3,820	1,260	993
13	990	1,600	1,160	1,040	1,380	1,550	4,120	7,880	15,100	3,680	1,200	969
14	990	1,230	990	1,040	1,230	1,640	3,890	7,840	14,700	3,540	1,200	969
15	990	1,160	990	1,020	1,160	1,880	3,780	8,980	15,100	3,540	1,160	947
16	990	1,100	1,020	940	1,130	2,140	3,630	10,200	15,000	3,480	1,130	947
17	1,020	1,100	1,160	890	1,040	2,540	3,750	9,650	14,400	3,280	1,130	969
18	1,130	1,160	1,100	940	1,230	2,660	4,300	10,100	13,500	3,150	1,100	969
19	1,040	1,160	1,100	1,160	1,230	2,970	4,430	9,380	14,000	2,960	1,100	969
20	1,020	1,130	1,070	1,230	1,230	3,360	4,410	8,830	13,900	2,710	1,100	993
21	1,020	1,340	1,100	890	1,130	3,940	4,250	8,610	13,100	2,590	1,070	993
22	990	1,600	1,160	810	1,100	4,140	4,280	9,030	12,500	2,420	1,070	993
23	990	1,830	1,160	810	1,160	4,700	4,620	9,300	12,300	2,300	1,070	993
24	990	1,730	1,300	780	1,130	4,680	5,330	9,640	11,200	2,190	1,070	993
25	965	1,640	1,100	1,040	1,160	4,200	6,500	9,500	9,500	2,080	1,040	993
26	965	1,380	990	965	1,160	3,700	8,200	9,100	8,750	2,020	1,040	993
27	965	1,100	990	1,040	1,130	3,420	8,500	8,690	8,150	1,970	1,020	993
28	940	1,230	1,040	1,160	1,040	3,340	8,300	8,260	9,160	1,860	1,020	993
29	940	1,300	1,100	1,230	....	3,470	7,640	7,700	8,400	1,760	1,020	993
30	940	1,300	1,100	1,340	....	4,260	7,300	8,750	7,970	1,720	1,020	1,020
31	940	....	1,160	2,250	....	5,250	....	9,620	....	1,670	993	....

NOTE.—Discharge determined as follows: Oct. 1 to Mar. 20, from a rating curve well defined between 900 and 8,000 second-feet; Mar. 21 to July 10, by shifting-channel methods; July 11 to Sept. 30, from a curve well defined between 1,000 and 4,000 second-feet.

Monthly discharge of Boise River near Highland, Idaho, for the year ending Sept. 30, 1911.

[Drainage area, 2,650 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	1,340	940	1,020	0.385	0.44	62,700	A.
November	1,830	890	1,230	.464	.52	73,200	A.
December	2,140	990	1,240	.468	.54	76,200	B.
January	2,250	780	1,070	.404	.47	65,800	A.
February	2,600	1,040	1,370	.517	.54	76,100	B.
March	5,250	1,040	2,570	.970	1.12	158,000	B.
April	8,500	3,630	5,400	2.04	2.28	321,000	B.
May	10,800	7,120	8,860	3.34	3.85	545,000	B.
June	15,100	7,970	12,300	4.64	5.18	732,000	B.
July	7,230	1,670	3,760	1.42	1.64	231,000	A.
August	1,580	993	1,210	.457	.53	74,400	A.
September	1,070	947	994	.375	.42	59,100	A.
The year	15,100	780	3,420	1.29	17.53	2,470,000	

SOUTH FORK OF BOISE RIVER NEAR PRAIRIE, IDAHO.

Location.—In sec. 24, T. 2 N., R. 6 E. Boise meridian, at R. S. Sandlin's ranch, about 1 mile above the mouth of Smiths Creek, about 3 miles above the flow line of the Arrowrock reservoir, 13 miles above the mouth of the South Fork, and about 18 miles above the Arrowrock dam; about 7 miles from Prairie post office. Smiths Creek, Long Gulch, and Rattlesnake Creek enter between the station and Boise River.

Records available.—March 24 to September 30, 1911.

Drainage area.—1,090 square miles.

Gage.—Sloping gage on right bank.

Channel.—Control seems permanent, though bed at the cable is composed of mud and gravel, and cuts out and fills.

Discharge measurements.—Made from cable about 75 feet above the gage.

Diversions.—No important diversions above or below, the river occupying a canyon with sheer walls 400 feet high for a large part of its course.

Accuracy.—Station rating curves well defined; results good.

Cooperation.—Expense of maintaining this station borne by United States Reclamation Service.

Discharge measurements of South Fork of Boise River near Prairie, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 24	A. B. Purton	4.10	1,190	July 17	O. W. Hartwell	4.12	1,420
May 12	do	6.20	3,590	18	do	3.97	1,260
June 13	do	8.3	6,290	Aug. 23	Lynn Crandall	2.50	426

Daily gage height, in feet, of South Fork of Boise River near Prairie, Idaho, for the year ending Sept. 30, 1911.

[R. S. Sandlin, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	5.1	5.8	7.0	5.5	3.0	2.4
2	....	5.3	6.0	7.2	5.2	3.0	2.3
3	....	5.5	6.3	7.6	5.1	3.0	2.3
4	....	5.4	6.6	8.0	....	3.0	....
5	....	5.0	7.3	7.9	5.3	3.0	2.4
6	....	4.7	7.7	7.7	5.2	2.9	....
7	....	4.5	7.3	7.6	5.3	2.9	....
8	....	4.5	7.0	8.0	5.1	2.9	....
9	....	4.6	6.8	7.8	4.9	2.8	....
10	....	4.6	6.5	7.2	4.7	2.8	....
11	....	4.4	6.3	7.2	4.6	2.7	....
12	....	4.2	6.2	7.9	4.4	2.7	....
13	....	4.1	....	8.4	4.3	2.7	....
14	....	4.1	6.4	8.2	4.2	2.6	....
15	....	4.0	6.5	8.2	4.2	2.6	....
16	....	4.0	7.3	8.3	4.1	2.6	....
17	....	4.1	6.9	8.0	4.1	....	....
18	....	4.2	....	7.8	4.0	2.6	....
19	....	4.3	....	7.9	3.9	2.6	....
20	....	4.4	....	7.9	3.8	2.5	2.3
21	....	4.3	6.2	7.7	3.7	2.6	....
22	....	4.3	6.4	7.5	3.6	2.5	....
23	....	4.5	6.6	7.4	3.6	2.5	....
24	4.1	5.1	6.8	7.1	3.5	2.5	2.3
25	4.0	5.5	6.8	6.7	3.5	2.5	2.3
26	....	....	6.5	6.2	3.4	2.5	....
27	3.6	6.5	6.4	5.8	3.3	....	....
28	3.5	6.6	6.1	6.3	3.3	....	2.3
29	3.5	6.3	6.0	5.9	3.2	2.4	....
30	4.0	6.0	6.1	5.6	3.1	....	....
31	4.6	....	6.2	....	3.1	....	....

Daily discharge, in second-feet, of South Fork of Boise River near Prairie, Idaho, for the year ending Sept. 30, 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	2,090	2,860	4,570	2,780	650	390
2	....	2,310	3,130	4,830	2,450	650	355
3	....	2,530	3,540	5,350	2,340	650	355
4	....	2,420	3,960	5,870	2,450	650	372
5	....	1,990	4,900	5,740	2,560	650	390
6	....	1,690	5,480	5,480	2,450	600	390
7	....	1,510	4,960	5,350	2,560	600	390
8	....	1,510	4,570	5,870	2,340	600	385
9	....	1,600	4,310	5,610	2,120	555	385
10	....	1,600	3,950	4,830	1,920	555	380
11	....	1,430	3,710	4,830	1,820	510	380
12	....	1,270	3,590	5,740	1,630	510	375
13	....	1,190	3,710	6,420	1,540	510	375
14	....	1,190	3,830	6,140	1,450	470	370
15	....	1,110	3,950	6,140	1,450	470	370
16	....	1,110	4,960	6,280	1,370	470	365
17	....	1,190	4,440	5,870	1,370	470	365
18	....	1,270	4,230	5,610	1,290	470	360
19	....	1,350	4,020	5,740	1,210	470	360
20	....	1,430	3,800	5,740	1,140	430	355
21	....	1,350	3,590	5,480	1,060	470	355
22	....	1,350	3,830	5,220	995	430	355
23	....	1,520	4,070	5,090	995	430	355
24	1,190	2,090	4,310	4,700	930	430	355
25	1,110	2,530	4,310	4,190	930	430	355
26	981	3,100	3,950	3,590	870	430	355
27	852	3,670	3,830	3,110	810	415	355
28	794	3,790	3,470	3,710	810	400	355
29	794	3,430	3,350	3,230	755	390	355
30	1,110	3,080	3,470	2,890	700	390	355
31	1,600	....	3,590	....	700	390	....

NOTE.—Discharge determined from two rating curves well defined below 4,000 second-feet and applicable Mar. 24 to May 1 and May 7 to Sept. 30. Shifting-channel methods used May 2 to 6. Discharges interpolated for days for which gage heights are missing.

Monthly discharge of South Fork of Boise River near Prairie, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
March 24-31	1,600	794	1,050	0.963	0.29	16,700	A.
April	3,790	1,110	1,920	1.76	1.97	114,000	A.
May	5,480	2,860	3,990	3.66	4.22	245,000	B.
June	6,420	2,890	5,110	4.69	5.24	304,000	B.
July	2,780	700	1,540	1.41	1.62	94,700	A.
August	650	390	501	.460	.53	30,800	A.
September	390	355	367	.337	.38	21,800	B.
The period	....	....	....	....	....	827,000	

MALHEUR RIVER AT RIVERSIDE, OREG.[1]

Location.—At the county highway bridge in sec. 22, T. 23 S., R. 37 E., about 1,000 feet below mouth of the South Fork, and about half a mile west of Riverside post office.

Records available.—January 16, 1909, to September 30, 1911.

Drainage area.—1,910 square miles. Area approximate, as watershed is not well defined on available maps.

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[1] Formerly known as "Middle Fork of Malheur River near Riverside, Oreg."

Gage.—Chain gage on downstream side of bridge. Staff gage referred to slightly different datum used prior to June 12, 1910.

Channel.—Gravel and small bowlders; control may be changed by ice jams.

Discharge measurements.—Made from the bridge or by wading.

Winter flow.—Affected by ice.

Diversions.—Some water is diverted above for ranches.

Accuracy.—Results good for ordinary stages. Extreme low and high stage records somewhat uncertain because of lack of discharge measurements at corresponding stages. Gage-height record of doubtful accuracy at times.

Discharge measurements of Malheur River at Riverside, Oreg., in tne year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*
Oct. 11	R. W. Davenport	1.20	49
Nov. 11	F. F. Henshaw	1.36	77
1911.			
Mar. 17	R. W. Davenport	3.97	1,680

Daily gage height, in feet, of Malheur River at Riverside, Oreg., for the year ending Sept. 30, 1911.

[J. C. Blaylock, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.15	1.25	1.9	1.55	3.9	1.9	3.65	....	1.6	1.2	0.7	0.7
2	1.15	1.25	1.85	1.6	2.9	1.8	3.6	....	1.6	1.2	.7	.7
3	1.2	1.25	1.7	1.6	2.35	1.7	3.5	....	1.6	1.2	.7	.7
4	1.2	1.25	2.8	1.6	2.1	1.7	3.4	....	1.8	1.2	.7	.7
5	1.2	1.25	2.5	1.55	2.15	1.9	3.3	2.3	1.85	1.2	.7	.65
6	1.1	1.25	2.0	1.5	1.95	2.75	3.0	2.2	1.9	1.2	.65	.65
7	1.1	1.25	1.9	1.5	2.05	3.95	2.8	....	1.85	1.2	.65	.8
8	1.1	1.3	1.75	1.45	2.0	3.3	2.7	2.2	1.85	1.1	.6	.8
9	1.2	1.3	1.95	1.45	2.0	3.2	2.8	2.15	1.85	1.1	.6	.8
10	1.2	1.3	2.3	1.45	1.95	3.2	2.8	2.1	1.85	1.1	.6	1.0
11	1.2	1.35	2.0	2.1	1.95	3.2	2.8	2.1	1.85	1.0	.6	1.0
12	1.2	1.35	2.0	2.1	1.9	3.55	2.6	1.95	1.8	1.0	.6	1.0
13	1.2	1.35	2.0	2.1	1.85	3.75	2.6	1.9	1.8	1.0	.6	1.0
14	1.2	1.4	2.3	1.8	1.95	3.85	2.4	1.85	1.7	1.0	.6	1.0
15	1.2	1.4	1.6	1.8	1.95	3.8	2.4	1.85	1.9	1.0	.6	1.0
16	1.2	1.4	1.6	1.8	2.0	4.15	2.3	1.85	1.7	1.0	.6	1.0
17	1.2	1.45	1.6	1.5	2.1	4.25	2.4	1.8	1.7	1.0	.6	1.0
18	1.25	1.45	1.4	1.55	2.15	4.0	2.55	1.8	1.7	1.0	.6	1.0
19	1.25	1.45	1.3	1.65	1.7	4.0	2.65	1.8	1.7	.9	.6	1.0
20	1.25	1.45	1.2	1.65	2.1	4.1	2.55	1.8	1.6	.9	.6	1.0
21	1.25	1.4	1.3	1.75	1.75	4.3	2.55	1.85	1.6	.8	.6	1.05
22	1.25	1.35	1.6	1.75	1.75	4.4	2.55	1.8	1.5	.8	.6	1.05
23	1.2	1.5	1.65	1.55	1.8	4.6	2.45	1.8	1.5	.7	.6	1.05
24	1.2	1.5	1.6	1.5	1.8	4.8	2.5	1.7	1.5	.7	.55	1.05
25	1.2	1.55	1.65	1.5	1.85	4.4	2.5	1.65	1.5	.7	.55	1.05
26	1.2	1.45	1.55	1.5	1.85	3.1	2.45	1.65	1.5	.7	.55	1.1
27	1.25	1.45	1.55	1.5	2.0	3.2	2.5	1.65	1.2	.7	.6	1.1
28	1.25	1.65	1.55	1.5	2.0	3.0	2.5	1.65	1.2	.7	.7	1.1
29	1.25	1.7	1.45	1.5	....	3.1	2.45	1.6	1.2	.7	.7	1.1
30	1.25	1.9	1.5	1.7	....	3.4	....	1.7	1.2	.7	.7	1.15
31	1.25	....	1.5	4.9	....	3.65	....	1.65	....	.7	.7	....

NOTE.—Gage heights affected by ice Jan. 11 to 30, and probably to a slight extent during February.

Daily discharge, in second-feet, of Malheur River at Riverside, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	46	57	172	102	1,590	218	1,320	404	142	73	23	23
2	46	57	161	110	680	190	1,270	393	142	73	23	23
3	51	57	129	110	381	165	1,170	382	142	73	23	23
4	51	57	490	110	281	165	1,070	370	190	73	23	23
5	51	57	355	102	300	218	984	359	204	73	23	20
6	41	57	195	93	233	588	748	318	218	73	20	20
7	41	57	172	93	264	1,650	617	318	204	73	20	31
8	41	63	140	85	248	984	558	318	204	61	17	31
9	51	63	184	85	248	900	617	300	204	61	17	31
10	51	63	280	85	233	900	617	281	204	61	17	50
11	51	70	195	......	233	900	617	281	204	50	17	50
12	51	70	195	......	218	1,220	503	233	190	50	17	50
13	51	70	195	......	204	1,420	503	218	190	50	17	50
14	51	77	280	......	233	1,530	403	204	165	50	17	50
15	51	77	110	......	233	1,480	403	204	218	50	17	50
16	51	77	110	......	248	1,900	359	204	165	50	17	50
17	51	85	110	......	281	2,030	403	190	165	50	17	50
18	57	85	77	......	300	1,710	477	190	165	50	17	50
19	57	85	63	......	165	1,710	530	190	165	40	17	50
20	57	85	51	......	281	1,840	477	190	142	40	17	50
21	57	77	63	......	178	2,100	477	204	142	31	17	56
22	57	70	110	......	178	2,230	477	190	121	31	17	56
23	51	93	120	......	190	2,510	427	190	121	23	17	56
24	51	93	110	......	190	2,800	451	165	121	23	14	56
25	51	102	120	......	204	2,230	451	154	121	23	14	56
26	51	85	102	......	204	821	427	154	121	23	14	61
27	57	85	102	......	248	900	451	154	73	23	17	61
28	57	120	102	......	248	748	451	154	73	23	23	61
29	57	129	85	......	......	821	427	142	73	23	23	61
30	57	172	93	......	......	1,070	416	165	73	23	23	67
31	57	......	93	2,640	......	1,320	......	154	......	23	23	......

NOTE.—Discharge Oct. 1 to Jan. 31, except for period in which gage heights were affected by ice, determined from a rating curve well defined between 50 and 1,500 second-feet. Mean discharge Jan. 11 to 30 estimated at 80 second-feet. Discharge Feb. 1 to Sept. 30 determined from a fairly well defined rating curve. Discharge interpolated Apr. 30 to May 4.

Monthly discharge of Malheur River at Riverside, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	57	41	51.6	3,170	B.
November	172	57	79.8	4,750	A.
December	490	51	154	9,470	C.
January	2,640	....	168	10,300	D.
February	1,590	165	303	16,800	C.
March	2,800	165	1,270	78,100	B.
April	1,320	359	603	35,900	B.
May	404	142	238	14,600	B.
June	218	73	155	9,220	B.
July	73	23	46.5	2,860	C.
August	23	14	18.6	1,140	C.
September	67	20	44.8	2,670	C.
The year	2,800	14	261	189,000	

MALHEUR RIVER AT VALE, OREG.

Location.—In sec. 29, T. 18 S., R. 45 E. Willamette meridian, at the highway bridge at Vale, Oreg., one-fourth mile below mouth of Bully Creek and 2½ miles above the mouth of Willow Creek.

Records available.—March 20, 1890, to Sept. 30, 1891; January 1, 1895, to September 30, 1896; April 15 to July 31, 1897; March 20, 1903, to April 1, 1907; May 29, 1908, to September 30, 1911.

Drainage area.—4,860 square miles.[1]

Gage.—Chain gage on downstream side of bridge. Gage datum unchanged since May 20, 1903.

Channel.—Gravel; shifts; one channel only.

Discharge measurements.—High-stage measurements made from a suspension footbridge about one-quarter mile below gage; low-stage measurements can be made by wading.

Diversions.—Important diversions for irrigation both above and below the station.

Winter flow.—Gage heights affected by ice during severe winters.

Accuracy.—Records for low stage not satisfactory on account of small shifts in channel; high-stage record probably reliable.

Discharge measurements of Malheur River at Vale, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*
Nov. 7	F. F. Henshaw	3.75	102
1911.			
Apr. 21	G. L. Parker	4.75	642
June 15	O. W. Hartwell	3.95	185
Sept. 15	Lynn Crandall	3.37	30.3

Daily gage height, in feet, of Malheur River at Vale, Oreg., for the year ending Sept. 30, 1911.

[Wilson and Dolan, observers.]

Day.	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	3.5	3.7	....	....	....	5.2	4.55	....	3.8	3.2	3.2
2	3.55	3.7	....	....	....	6.2	4.45	....	3.8	3.2	3.2
3	3.55	3.7	....	....	....	6.15	4.4	....	3.8	3.15	3.2
4	3.55	3.7	....	....	....	5.85	4.35	....	3.7	3.15	3.2
5	3.6	3.7	....	....	....	5.65	4.35	....	3.6	3.15	3.2
6	3.6	3.7	....	....	7.25	5.5	4.35	....	3.6	3.15	3.2
7	3.6	3.75	4.0	....	7.25	5.4	....	....	3.5	3.2	3.2
8	3.65	3.75	3.95	....	7.25	5.25	....	....	3.5	3.2	3.2
9	3.65	3.8	3.95	....	7.25	5.2	....	....	3.5	3.2	3.2
10	3.65	3.85	4.2	....	7.25	5.15	....	....	3.4	3.2	3.2
11	3.65	3.85	4.0	7.2	7.25	5.15	....	....	3.4	3.2	3.25
12	3.65	3.9	3.95	7.2	7.25	5.15	....	3.9	3.3	3.2	3.25
13	3.65	3.85	4.0	7.2	7.25	5.15	....	....	3.3	3.2	3.25
14	3.65	3.85	4.0	7.2	7.25	5.1	....	....	3.4	3.2	3.25
15	3.65	3.85	4.0	7.25	7.25	5.1	....	3.95	3.4	3.2	3.35
16	3.65	3.9	4.05	7.3	7.25	4.95	....	....	3.4	3.2	3.25
17	3.65	3.9	4.05	7.35	7.2	4.75	....	....	3.4	3.2	3.25
18	3.65	3.9	4.05	7.45	7.2	4.6	....	3.8	3.35	3.2	3.3
19	3.65	3.9	4.05	8.25	6.9	4.65	....	3.8	3.3	3.2	3.3
20	3.65	....	4.05	8.35	6.95	4.6	....	3.8	3.3	3.2	3.35
21	3.6	....	4.05	8.35	7.15	4.75	....	3.8	3.3	3.2	3.35
22	3.6	....	4.1	8.35	7.2	4.65	....	3.75	3.3	3.2	3.35
23	3.6	....	4.1	8.35	7.3	4.7	....	3.7	3.3	3.2	3.35
24	3.6	....	....	8.25	7.45	4.7	....	3.7	3.3	3.2	3.35
25	3.6	....	....	8.25	7.15	4.7	....	3.7	3.3	3.2	3.4
26	3.6	....	....	8.25	6.65	4.7	....	3.7	3.3	3.2	3.4
27	3.6	....	....	....	6.6	4.65	....	3.7	3.25	3.2	3.4
28	3.6	....	....	....	5.6	4.65	....	3.75	3.25	3.2	3.4
29	3.65	....	....	....	5.6	4.65	....	3.8	3.25	3.2	3.4
30	3.65	....	6.05	....	5.8	4.65	....	3.8	3.2	3.2	3.4
31	3.7	....	6.05	....	5.15	....	....	....	3.2	3.2	....

NOTE.—The recorded gage heights for Feb. 11 to 26 and Mar. 6 to about Mar. 17 are believed to be unreliable, due to either poor gage observations or the presence of an ice jam below.

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[1] Value published in 1906 report is accepted as probably better than 4,190 as used in 1909 and 1910 reports. Area is approximate, as watershed is not well defined on available maps.

Daily discharge, in second-feet, of Malheur River at Vale, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.	45	89	228	......	......	......	946	521	......	133	11	11
2.	56	89	271	......	......	......	1,830	464	......	133	11	11
3.	56	89	271	......	......	......	1,780	436	......	133	8	11
4.	56	89	260	......	......	......	1,490	409	......	103	8	11
5.	66	89	228	......	......	......	1,310	409	......	77	8	11
6.	66	89	641	......	......	......	1,180	409	......	77	8	11
7.	66	101	487	176	......	......	1,100	......	......	54	11	11
8.	78	101	294	160	......	......	984	......	......	54	11	11
9.	78	113	256	160	......	......	946	......	......	54	11	11
10.	78	126	224	254	......	......	910	......	......	35	11	11
11.	78	126	283	176	......	......	910	......	......	35	11	16
12.	78	140	395	160	......	......	910	......	167	21	11	16
13.	78	126	294	176	......	......	910	......	174	21	11	16
14.	78	126	294	176	......	......	874	......	180	35	11	16
15.	78	126	279	176	......	......	874	......	186	35	11	28
16.	78	140	379	194	......	......	772	......	168	35	11	16
17.	78	140	209	194	......	......	642	......	150	35	11	16
18.	78	140	209	194	......	2,940	550	......	133	28	11	21
19.	78	140	209	194	......	2,580	580	......	133	21	11	21
20.	78	174	176	194	......	2,640	550	......	133	21	11	28
21.	66	167	147	194	......	2,880	642	......	133	21	11	28
22.	66	146	150	213	......	2,940	580	......	118	21	11	28
23.	66	151	147	213	......	3,060	610	......	103	21	11	28
23.	66	144	181	......	......	3,250	610	......	103	21	11	28
25.	66	182	180	......	......	2,880	610	......	103	21	11	35
26.	66	182	160	......	......	2,300	610	......	103	21	11	35
27.	66	207	157	......	......	2,250	580	......	103	16	11	35
28.	66	174	132	......	......	1,260	580	......	118	16	11	35
29.	78	135	129	......	......	1,260	580	......	133	16	11	35
30.	78	194	127	1,680	......	1,440	580	......	133	11	11	35
31.	89	......	118	1,680	......	910	......	......	......	11	11	......

NOTE.—Discharge Oct. 1 to Nov. 19, 1910, determined from a fairly well defined rating curve; discharge Nov. 20 to 30 estimated as the sum of the discharge of Malheur River at Riverside and North Fork near Beulah plus 10 second-feet; discharge for December is the sum of discharge at these two stations plus an allowance of 20 second-feet for inflow.

Discharge for the periods Jan. 7 to 23, Jan. 30 to 31, Mar. 18 to May 6, and June 12 to Sept. 30, 1911, were determined from four fairly well defined rating curves; mean discharges were estimated as follows: Jan. 1 to 6 and 24 to 29, 180 second-feet; Feb. 1 to 5, 1,400 second-feet; Feb. 6 to 28, 360 second-feet; Mar. 1 to 5, 380 second-feet; Mar. 6 to 10, 1,500 second-feet; Mar. 11 to 17, 1,900 second-feet; May 7 to 31, 210 second-feet; June 1 to 11, 200 second-feet.

Monthly discharge of Malheur River at Vale, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	89	45	70.9	4,360	B.
November	207	89	134	7,970	C.
December	641	118	242	14,900	C.
January	1,680	......	281	17,300	D.
February	......	......	546	30,300	D.
March	......	......	1,780	109,000	D.
April	1,830	550	868	51,600	B.
May	521	......	255	15,700	D.
June	......	103	159	9,460	C.
July	133	11	43.1	2,650	B.
August	11	8	10.6	652	B.
September	35	11	20.9	1,240	C.
The year	......	8	367	265,000	

SOUTH FORK OF MALHEUR RIVER AT RIVERSIDE, OREG.

Location.—In sec. 27, T. 23 S., R. 37 E., about 1,000 feet above the mouth and about three-quarters of a mile from Riverside post office.

Records available.—May 25, 1910, to September 30, 1911.

Drainage area.—800 square miles. Area approximate as water shed is not well defined on available maps.

Gage.—Vertical staff in three sections on right bank.

Channel.—Gravel and bowlders; free from vegetation and not likely to shift.

Discharge measurements.—Made from cable just above the gage or by wading.

Diversions.—A small but undetermined amount of water is used for irrigation along the stream.

Winter flow.—Affected by ice during severe winters. Ice jams form occasionally above the station.

Accuracy.—Results good except at extreme low stages or at times when gage heights are affected by ice.

Discharge measurements of South Fork of Malheur River at Riverside, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 10	R. W. Davenport	1.62	9.8	Mar. 18	R. W. Davenport	3.96	721
Nov. 11	F. F. Henshaw	1.72	15.6				

Daily gage height, in feet, of South Fork of Malheur River at Riverside, Oreg., for the year ending Sept. 30, 1911.

[J. C. Blaylock, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.6	1.65	2.0	1.9	3.5	2.1	2.75	....	1.8	1.8	1.7	1.7
2	1.65	1.65	1.95	2.0	2.7	2.0	2.75	....	1.8	1.8	1.7	1.7
3	1.65	1.65	1.8	2.0	2.1	1.9	2.6	....	1.8	1.8	1.7	1.7
4	1.65	1.65	3.3	2.0	2.1	1.8	2.6	....	1.8	1.8	1.7	1.75
5	1.6	1.65	2.55	1.9	2.15	1.9	2.5	1.7	1.8	1.8	1.7	1.75
6	1.6	1.65	2.3	1.8	2.0	3.0	2.5	1.8	1.8	1.75	1.7	1.75
7	1.6	1.65	2.0	1.8	2.0	4.0	2.3	1.9	1.8	1.75	1.7	1.75
8	1.6	1.7	1.75	1.8	2.1	3.75	2.2	1.9	1.8	1.75	1.7	1.75
9	1.6	1.7	2.3	1.8	2.1	3.5	2.3	1.8	1.8	1.7	1.75	1.75
10	1.6	1.7	2.3	1.8	2.0	3.6	2.2	1.75	1.8	1.7	1.75	1.8
11	1.6	1.7	2.3	1.9	2.0	3.7	2.2	1.75	1.75	1.7	1.7	1.8
12	1.6	1.7	2.4	1.9	2.3	3.3	2.3	1.7	1.75	1.7	1.7	1.8
13	1.65	1.7	2.4	1.9	2.1	3.3	2.3	1.7	1.7	1.7	1.7	1.8
14	1.65	1.75	2.4	1.9	2.2	3.7	2.1	1.7	1.7	1.75	1.7	1.8
15	1.65	1.75	2.4	1.9	1.85	3.7	2.1	1.7	1.7	1.75	1.7	1.8
16	1.65	1.75	1.9	1.9	1.85	4.0	2.0	1.8	1.7	1.75	1.7	1.8
17	1.65	1.75	1.6	1.8	2.05	4.2	2.0	1.8	1.7	1.7	1.7	1.8
18	1.65	1.75	1.7	1.8	2.1	4.0	2.0	1.8	1.7	1.7	1.7	1.8
19	1.65	1.75	1.8	2.0	1.9	3.9	2.0	1.8	1.6	1.7	1.7	1.8
20	1.65	1.75	1.8	2.2	1.9	3.9	2.0	1.8	1.6	1.7	1.7	1.8
21	1.65	1.75	1.8	2.2	1.95	4.25	2.0	1.8	1.6	1.7	1.7	1.85
22	1.65	1.75	1.7	2.2	2.0	4.35	2.0	1.8	1.65	1.7	1.7	1.85
23	1.6	1.8	1.75	2.0	2.0	4.25	2.0	1.8	1.7	1.7	1.7	1.85
24	1.6	1.8	2.0	2.3	2.2	4.2	2.0	1.75	1.7	1.7	1.65	1.85
25	1.6	1.85	2.0	2.3	2.2	4.3	2.0	1.75	1.7	1.7	1.65	1.85
26	1.65	1.9	1.9	2.3	2.2	3.0	1.9	1.75	1.75	1.7	1.65	1.8
27	1.65	1.9	1.9	2.3	2.2	3.0	1.9	1.8	1.75	1.7	1.65	1.8
28	1.65	2.0	1.75	2.3	2.2	2.85	1.9	1.8	1.75	1.7	1.65	1.8
29	1.65	2.0	1.9	2.3	....	2.7	1.9	1.8	1.8	1.7	1.65	1.8
30	1.65	2.2	1.9	2.4	....	3.0	....	1.8	1.8	1.7	1.65	1.85
31	1.65	....	1.9	4.5	....	3.0	....	1.8	....	1.7	1.7	....

NOTE.—Gage heights affected by ice Jan. 11 to 30.

Daily discharge, in second-feet, of South Fork of Malheur River at Riverside, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	9	12	37	29	413	48	151	24	21	21	15	15
2	12	12	32	38	140	38	151	22	21	21	15	15
3	12	12	20	38	48	29	120	20	21	21	15	15
4	12	12	342	38	48	21	120	17	21	21	15	18
5	9	12	116	29	54	29	102	15	21	21	15	18
6	9	12	74	21	38	215	102	21	21	18	15	18
7	9	12	37	21	38	751	72	29	21	18	15	18
8	9	14	17	21	48	563	59	29	21	18	15	18
9	9	14	74	21	48	413	72	21	21	15	18	18
10	9	14	74	21	38	468	59	18	21	15	18	21
11	9	14	74	20	38	529	59	18	18	15	15	21
12	9	14	89	20	72	320	72	15	18	15	15	21
13	12	14	89	20	48	320	72	15	15	15	15	21
14	12	17	89	20	59	529	48	15	15	18	15	21
15	12	17	89	20	25	529	48	15	15	18	15	21
16	12	17	28	20	25	751	38	21	15	18	15	21
17	12	17	9	15	43	925	38	21	15	15	15	21
18	12	17	14	15	48	751	38	21	15	15	15	21
19	12	17	20	15	29	671	38	21	10	15	15	21
20	12	17	20	15	29	671	38	21	10	15	15	21
21	12	17	20	15	34	971	38	21	10	15	15	25
22	12	17	14	15	38	1,060	38	21	12	15	15	25
23	9	20	17	15	38	971	38	21	15	15	15	25
24	9	20	37	15	59	925	38	18	15	15	12	25
25	9	24	37	20	59	1,020	38	18	15	15	12	25
26	12	28	28	20	59	215	29	18	18	15	12	21
27	12	28	28	20	59	215	29	21	18	15	12	21
28	12	37	17	20	59	174	29	21	18	15	12	21
29	12	37	28	30	....	140	29	21	21	15	12	21
30	12	60	28	50	....	215	27	21	21	15	12	25
31	12	....	28	1,210	....	215	....	21	....	15	15	....

NOTE.—Discharge, except during period in which gage heights were affected by ice, determined from a well-defined rating curve. Discharges Jan. 11 to 30 estimated; discharge Apr. 30 to May 4 interpolated.

Monthly discharge of South Fork of Malheur River at Riverside, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	12	9	10.8	664	B.
November	60	12	19.2	1,140	B.
December	342	9	52.5	3,230	B.
January	1,210	15	60.9	3,740	D.
February	413	25	61.9	3,440	A.
March	1,060	21	474	29,100	A.
April	151	27	61.0	3,630	A.
May	29	15	20.0	1,230	A.
June	21	10	17.3	1,030	A.
July	21	15	16.5	1,010	A.
August	18	12	14.5	892	A.
September	25	15	20.6	1,230	A.
The year	1,210	9	69.6	24,100	

NORTH FORK OF MALHEUR RIVER NEAR BEULAH, OREG.

Location.—In sec. 22, T. 20 S., R. 37 E., at the lower end of the Beulah or Agency Valley reservoir site and about 7 miles below Beulah.

Records available.—March 21, 1909, to September 30, 1911.

Drainage area.—436 square miles. Area approximate as watershed is not well defined on available maps.

Gage.—Vertical staff installed May 26, 1910. Previous to this date a chain gage located about 300 feet upstream was used.

Channel.—Gravel and small bowlders; shifting slightly in extreme floods.

Discharge measurements.—Made from cable 150 feet below present gage, or by wading.

Winter flow.—Affected by ice in severe winters only. Flow may be retarded at times by freezing in Agency Valley.

Diversions.—Small amount of water is used for irrigation above the station.

Accuracy.—Results good except for periods of extreme high water.

Discharge measurements of North Fork of Malheur River near Beulah, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 11	R. W. Davenport......	1.80	50.2	Mar. 16	R. W. Davenport......	2.38	148
Nov. 10	F. F. Henshaw.........	1.90	66	16	.....do..................	2.34	145
				July 5	O. W. Hartwell........	1.93	58.6

Daily gage height, in feet, of North Fork of Malheur River near Beulah, Oreg., for the year ending Sept. 30, 1911.

[J. B. Robinson and Michael Foley, observers.]

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.8	2.0	2.0	2.2	2.0	2.9	2.7	2.3	2.0	1.5	1.45
2	1.8	2.0	1.9	2.0	1.9	3.5	2.7	2.4	2.0	1.5	1.5
3	1.9	2.0	2.0	1.9	2.0	3.2	2.6	2.4	2.0	1.5	1.5
4	1.95	2.3	2.0	1.9	2.0	2.7	2.6	2.5	1.9	1.5	1.55
5	1.75	2.2	2.0	1.9	2.2	2.8	2.6	2.6	1.9	1.5	1.55
6	1.7	2.0	2.0	1.7	2.2	2.9	2.7	2.5	1.9	1.5	1.6
7	1.9	1.9	1.9	1.6	2.7	2.7	2.6	2.4	1.8	1.5	1.6
8	2.0	1.9	2.0	1.7	2.2	2.6	2.5	2.5	1.8	1.5	1.6
9	2.1	2.0	2.0	1.7	2.3	2.9	2.5	2.4	1.8	1.5	1.6
10	1.9	2.1	1.9	1.7	2.1	2.9	2.3	2.4	1.8	1.5	1.6
11	1.9	2.0	1.7	1.8	2.0	2.4	2.4	2.4	1.8	1.5	1.55
12	1.9	2.0	1.8	1.8	2.0	2.8	2.4	2.4	1.8	1.5	1.55
13	1.9	1.9	2.2	1.8	2.2	2.6	2.4	2.3	1.8	1.45	1.6
14	1.9	2.0	2.0	1.6	2.1	2.6	2.4	2.4	1.8	1.5	1.6
15	1.9	2.0	1.9	1.6	2.3	2.6	2.3	2.4	1.8	1.5	1.6
16	1.9	2.0	1.8	1.7	2.4	2.7	2.3	2.2	1.8	1.4	1.6
17	1.95	2.0	1.7	1.8	2.4	....	2.5	2.2	1.8	1.4	1.6
18	2.0	2.0	1.7	1.8	2.2	....	2.5	2.2	1.7	1.4	1.6
19	1.95	1.9	2.0	1.7	2.7	....	2.7	2.1	1.7	1.55	1.6
20	1.8	2.0	2.0	1.7	3.6	....	2.4	2.0	1.7	1.55	1.6
21	1.9	1.9	1.7	1.6	3.5	....	2.3	2.0	1.7	1.55	1.6
22	1.9	1.8	1.7	1.6	3.7	2.7	2.3	2.0	1.7	1.5	1.6
23	2.0	1.7	1.6	1.7	4.2	2.5	2.35	2.0	1.5	1.5	1.6
24	2.0	1.6	1.4	1.6	4.0	2.5	2.4	2.0	1.6	1.5	1.6
25	2.1	1.4	1.2	1.8	3.9	2.4	2.4	2.0	1.6	1.5	1.65
26	2.0	1.2	1.0	2.0	3.0	2.6	2.3	2.0	1.55	1.5	1.65
27	1.7	1.1	1.0	2.0	3.0	2.5	2.3	2.0	1.5	1.5	1.65
28	1.9	1.0	1.1	1.9	2.9	2.6	2.2	2.0	1.5	1.5	1.65
29	2.0	1.3	2.0	....	3.0	2.6	2.2	2.0	1.5	1.5	1.65
30	2.0	1.4	2.0	....	3.0	3.0	2.25	2.0	1.5	1.45	1.7
31	....	1.8	2.1	....	2.9	....	2.2	....	1.5	1.45	....

NOTE.—Gage heights probably not seriously affected by ice. The low gage heights in December and January probably caused by reduction of flow on account of freezing in Agency Valley. No records obtained for October, 1911.

Daily discharge, in second-feet, of North Fork of Malheur River near Beulah, Oreg., for the year ending Sept. 30, 1911.

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	51	79	79	112	79	275	212	115	67	18	15
2	51	79	64	79	64	585	212	136	67	18	18
3	64	79	79	64	79	402	184	136	67	18	18
4	72	131	79	64	79	212	184	159	55	18	22
5	46	112	79	64	112	242	184	184	55	18	22
6	40	79	79	40	112	275	212	159	55	18	25
7	64	64	64	30	240	212	184	136	44	18	25
8	79	64	79	40	112	184	159	159	44	18	25
9	95	79	79	40	131	275	159	136	44	18	25
10	64	95	64	40	95	275	115	136	44	18	25
11	64	79	40	51	79	242	136	136	44	18	22
12	64	79	51	51	79	242	136	136	44	18	22
13	64	64	112	51	112	184	136	115	44	15	25
14	64	79	79	30	95	184	136	136	44	18	25
15	64	79	64	30	131	184	115	136	44	18	25
16	64	79	51	40	153	212	115	97	44	12	25
17	72	79	40	51	153	212	159	97	44	12	25
18	79	79	40	51	112	212	159	97	34	12	25
19	72	64	79	40	240	212	212	81	34	22	25
20	51	79	79	40	730	212	136	67	34	22	25
21	64	64	40	30	660	212	115	67	34	22	25
22	64	51	40	30	800	212	115	67	34	18	25
23	79	40	30	40	1,250	159	126	67	18	18	25
24	79	30	17	30	960	159	136	67	25	18	25
25	95	17	10	51	880	136	136	67	25	18	30
26	79	10	5	79	312	184	115	67	22	18	30
27	40	7	5	79	312	159	115	67	18	18	30
28	64	5	7	64	275	184	97	67	18	18	30
29	79	13	79	....	312	184	97	67	18	18	30
30	79	17	79	....	312	312	106	67	18	15	34
31	....	51	95	....	275	....	97	....	18	15	....

NOTE.—Discharge determined as follows: Nov. 1 to Mar. 23 from a rating curve well defined between 50 and 200 second-feet; Mar. 24 to Sept. 30, from a curve well defined between 50 and 300 second-feet and fairly-well defined above 300 second-feet. Apr. 17 to 21, interpolated.

Monthly discharge of North Fork of Malheur River near Beulah, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	....	....	[a]50.0	3,070	C.
November	95	40	66.9	3,980	A.
December	131	5	62.1	3,820	B.
January	112	5	57.6	3,540	B.
February	112	30	50.4	2,800	B.
March	1,250	64	301	18,500	C.
April	585	136	231	13,700	B.
May	212	97	145	8,920	A.
June	184	67	107	6,370	A.
July	67	18	38.7	2,380	B.
August	22	12	17.5	1,080	C.
September	34	15	24.9	1,480	C.
The year	1,250	5	96.5	69,600	

[a] Estimated.

BULLY CREEK AT WESTFALL, OREG.

Location.—In sec. 20, T. 18 S., R. 41 E. Willamette meridian, at the bridge at Jay Branson's ranch on the Vale-Burns stage road, three-fourths of a mile southwest of Westfall post office and just below mouth of Indian Creek.

Records available.—June 21 to July 29, 1911.

Drainage area.—Not measured.

Gage.—Chain gage at the bridge.

Channel.—Bed of gravel and sand; probably shifting; one channel only.

Discharge measurements.—Made from the bridge or by wading.

Diversions.—Water diverted both above and below station. During the summer practically the only flow at the station is return water and seepage. Dam site for a proposed reservoir is situated about one-fourth mile above station.

Accuracy.—Artificial control above and below impaired records during the summer; data insufficient for estimates of discharge.

Cooperation.—Gage-height record furnished by H. M. Gilliam, of Westfall, Oreg.

Discharge measurements of Bully Creek at Westfall, Oreg., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 21	G. L. Parker	1.83	6.8
June 18	O. W. Hartwell	1.58	2.4

Daily gage height, in feet, of Bully Creek at Westfall, Oreg., for 1911.

[L. A. Mansur, observer.]

Day.	June.	July.	Day.	June.	July.	Day.	June.	July.
1	....	1.79	11	....	1.75	21	1.58	1.77
2	....	1.79	12	....	1.79	22	1.69	1.75
3	....	1.79	13	....	1.79	23	1.69	1.78
4	....	1.79	14	....	1.75	24	1.73	1.77
5	....	1.81	15	....	1.75	25	1.75	1.83
6	....	1.83	16	....	1.69	26	1.75	1.83
7	....	1.87	17	....	1.71	27	1.75	1.83
8	....	1.83	18	....	1.75	28	1.77	1.79
9	....	1.83	19	....	1.79	29	1.75	1.83
10	....	1.79	20	....	1.79	30	1.77	....
						31	....	....

BULLY CREEK AT WARMSPRING, NEAR VALE, OREG.[1]

Location.—In sec. 4, T. 18 S., R. 43 E. Willamette meridian, about one-fourth mile below mouth of Cottonwood Creek, and the same distance below the Warmspring stage station, on the road from Vale to Westfall; about 13 miles from Vale post office.

Records available.—August 11, 1903, to March 10, 1904; January 24, 1905, to March 31, 1907; February 1 to March 12, 1910; January 1 to September 30, 1911.

Drainage area.—Not measured.

Gage.—Staff gage in three sections—two vertical and one inclined—on left bank.

Channel.—Bed of coarse gravel; probably shifting; one channel only.

Discharge measurements.—Made from a cable or by wading.

Diversions.—A mile or two above the station is a proposed dam site. Numerous ranch diversions up and down the creek.

Winter flow.—Not affected by ice.

Accuracy.—Changing conditions make estimates rather approximate at times.

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[1] Formerly known as "Bully Creek above Vale."

Discharge measurements of Bully Creek at Warmspring, near Vale, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Dec. 30	I. E. Oakes	1.22	20.4	Apr. 23	G. L. Parker	0.97	5.1
				June 18	O. W. Hartwell	.92	2.7
				Sept. 16	Lynn Crandall	.8	[a] .2

Daily gage height, in feet, of Bully Creek at Warmspring, near Vale, Oreg., for the year ending Sept. 30, 1911.

[Tom Jackson, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.2	2.45	1.5	1.5	0.9	0.9	1.0	0.3	
2	1.2	1.65	1.4	1.5	.85	.9	.9	.2	
3	1.2	1.6	1.5	1.5	.85	.9	.9		
4	1.2	1.55	1.8	1.5	.85	.95	.9		
5	1.2	1.5	2.1	1.5	.85	.9	.9		
6	1.2	1.55	2.5	1.5	.9	.9	.85		
7	1.2	1.6	3.7	1.5	.8	.9	.8		
8	1.1	1.55	3.05	1.5	.8	1.5	.8		
9	1.0	1.5	2.3	1.4	.8	1.4	.8		
10	1.0	1.45	2.5	1.35	.8	1.4	.8		
11	1.0	1.4	2.3	1.3	.8	.95	.75		
12	1.5	1.4	2.25	1.25	.8	.95	.7		
15	1.5	1.45	2.2	1.2	.8	.9	.7		
14	1.3	1.4	2.4	1.15	.8	.95	.7		
15	1.4	1.4	2.1	1.0	.85	1.1	.7		
16	1.3	1.35	2.25	1.0	.9	1.0	.65		0.8
17	1.3	1.35	2.35	1.0	.9	1.0	.65		.8
18	1.6	1.3	2.45	1.0	.95	.95	.65		.8
19	1.65	1.3	3.1	1.05	.95	.9	.6		.8
20	1.35	1.3	3.15	1.1	.95	.9	.6		.8
21	1.35	1.35	3.35	1.1	.95	.85	.55		.8
22	1.3	1.4	3.2	1.15	.95	.9	.55		.9
23	1.5	1.45	3.15	1.1	.95	.85	.5		.9
24	1.6	1.45	2.8	1.0	.95	.85	.5		.9
25	1.6	1.55	2.15	1.0	.95	.8	.5		.9
26	1.65	1.55	1.95	1.0	.95	.85	.5		.95
27	1.7	1.5	1.8	1.0	.95	.8	.45		.95
28	1.75	1.45	1.7	.95	.95	.9	.45		.95
29	1.7		1.6	.95	.9	.9	.4		.95
30	1.6		1.5	.95	.9	1.0	.4		.95
31	2.4		1.6		.9		.4		

NOTE.—Water standing in pools Aug. 2 to Sept. 15. Gage read 1.05 feet on Nov. 7, 1910.

Daily discharge, in second-feet, of Bully Creek at Warmspring, near Vale, Oreg., for the year ending Sept. 30, 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	20	244	52	52	2.5	2.5	6.5	0.1	....
2	20	74	40	52	1.8	2.5	2.5	....	....
3	20	66	52	52	1.8	2.5	2.5	....	....
4	20	59	98	52	1.8	4.5	2.5	....	....
5	20	52	158	52	1.8	2.5	2.5	....	....
6	20	59	258	52	2.5	2.5	1.8	....	....
7	20	66	796	52	1.0	2.5	1.0	....	....
8	12	59	450	52	1.0	52	1.0	....	....
9	6.5	52	204	40	1.0	40	1.0	....	....
10	6.5	46	258	34	1.0	40	1.0	....	....
11	6.5	40	204	29	1.0	4.5	.8	....	....
12	52	40	192	24	1.0	4.5	.6	....	....
13	52	46	180	20	1.0	2.5	.6	....	....
14	29	40	230	16	1.0	4.5	.6	....	....
15	40	40	158	6.5	1.8	12	.6	....	....
16	29	34	192	6.5	2.5	6.5	.5	....	0.2
17	29	34	217	6.5	2.5	6.5	.5	....	.2
18	66	29	244	6.5	4.5	4.5	.5	....	.2
19	74	29	471	9.5	4.5	2.5	.4	....	.2
20	34	29	494	12	4.5	2.5	.4	....	.2
21	34	34	590	12	4.5	1.8	.4	....	.2
22	29	40	516	16	4.5	2.5	.4	....	.6
23	52	46	494	12	4.5	1.8	.3	....	.6
24	66	46	354	6.5	4.5	1.8	.3	....	.6
25	66	59	169	6.5	4.5	1.0	.3	....	.6
26	74	59	127	6.5	4.5	1.8	.3	....	1.3
27	81	52	98	6.5	4.5	1.0	.2	....	1.3
28	90	46	81	4.5	4.5	2.5	.2	....	1.3
29	81	....	66	4.5	2.5	2.5	.2	....	1.3
30	66	....	52	4.5	2.5	6.5	.2	....	1.3
31	230	....	66	....	2.5	....	.2	....	....

NOTE.—Discharge determined as follows: Jan. 1 to Aug. 2, from a rating curve fairly well defined from 3.0 to 150 second-feet. Sept. 16 to 30 from a fairly well-defined curve. No flow Aug. 2 to Sept. 15.

Monthly discharge of Bully Creek at Warmspring, near Vale, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	230	6.5	46.6	2,870	B.
February	244	29	54.3	3,020	B.
March	796	40	244	15,000	C.
April	52	4.5	23.5	1,400	B.
May	4.5	1.0	2.71	167	C.
June	52	1.0	7.51	447	B.
July	6.5	.2	.99	61	D.
August	.1	.0	.00	0	
September	1.3	.0	.34	20	C.
The period	....	....	....	23,000	

WILLOW CREEK NEAR MALHEUR, OREG.

Location.—At what is known as reservoir No. 3 of the Willow Creek project, the dam of which is situated in the E. ½ NE. ¼ sec. 15, T. 14 S., R. 41 E., near the site of the station maintained by the United States Geological Survey, 1904 to 1906, and about 5 miles southeast of Malheur.

Records available.—November 20, 1904, to August 14, 1906; March 29, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Gages below the dam and above the backwater of the reservoir were used during 1910 and 1911. The gage used 1904 to 1906 was located at the mouth of the canyon near Beer's ranch.

Channel.—No information concerning present conditions.

Discharge measurements.—Made with a Lallie current meter at high stages. The low-water flow was determined by a 1.5-foot sharp-crested rectangular weir with end contractions.

Cooperation.—Station reestablished March 19, 1910, by the James A. Green Engineering & Construction Co., which has furnished the records of daily discharge.

Daily discharge, in second-feet, of Willow Creek near Malheur, Oreg., for the year ending Sept. 30, 1911.

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1	....	2.24	1.9	60	3.2	12.6	1.4	0.6	2.5	0.04
2	....	2.24	1.4	45	3.3	12.1	1.4	.4	2.0	.04
3	....	2.17	1.1	7.0	4.0	10.8	1.8	.4	1.5	....
4	....	3.39	1.2	5.3	5.0	11.8	3.8	.4	1.3	....
5	....	3.12	1.7	5.3	16.3	12.0	2.2	.4	1.0	....
6	....	2.85	1.6	4.4	136	10.8	2.3	.4	.5	....
7	....	2.57	2.7	4.4	400	5.4	3.0	.2	.6	....
8	....	2.64	2.9	3.9	225	4.0	2.7	.2	.9	....
9	....	2.57	3.4	3.8	135	3.1	2.2	.2	1.0	....
10	....	2.72	4.0	3.8	100	3.0	2.3	.2	.4	....
11	....	2.57	3.4	4.1	80	2.9	2.7	.2	.3	....
12	....	2.94	1.4	4.0	63.1	3.0	3.0	.2	.1	....
13	....	2.85	2.5	4.0	74.7	3.0	2.9	3.3	.04	....
14	....	2.94	2.7	3.7	77.4	3.2	3.2	2.1	.04	....
15	....	2.72	3.3	4.0	68.6	3.0	3.0	2.2	.04	....
16	....	2.85	2.9	3.7	58.0	2.8	3.0	3.3	.04	....
17	....	2.57	2.7	3.4	46.7	2.8	3.0	3.3	.04	....
18	....	1.07	2.7	3.4	45.0	3.2	3.2	3.3	.04	....
19	....	3.25	2.9	3.1	44.0	3.2	3.3	1.2	.04	....
20	....	2.24	3.2	3.4	45.0	2.5	3.4	.5	.04	....
21	....	1.50	2.8	3.7	44.0	2.5	2.1	.3	.04	....
22	....	.65	2.7	3.3	27.4	1.8	2.1	.3	.04	....
23	....	3.00	1.9	3.3	21.2	1.8	2.1	1.4	.04	....
24	....	4.45	2.1	3.3	24.6	2.0	2.1	1.4	.04	....
25	....	4.12	2.5	3.3	19.5	1.5	2.2	1.5	.04	....
26	....	3.30	2.5	3.7	18.1	1.8	2.1	.0	.04	....
27	....	4.59	2.5	3.7	13.5	1.5	1.4	.0	.04	....
28	....	5.60	2.7	3.3	14.5	1.5	1.4	.0	.04	....
29	1.44	4.45	2.8	....	14.6	1.5	1.3	1.8	.04	....
30	2.30	3.30	3.4	....	11.9	1.4	1.2	1.7	.04	....
31	....	2.10	50	....	11.7	....	.9	....	.04	....

NOTE.—The headgates at the dam were open Jan. 31 to Feb. 5 and the discharge was estimated from gage heights recorded 800 feet below the dam in the SW. ¼ sec. 14, T. 14 S., R. 41 E. Discharge Mar. 8 to 11 and 18 to 21 estimated from readings on a temporary gage above the backwater of the dam. In other days the discharges were measured with a Lallie current meter or by a 1.5 foot sharp-crested rectangular weir with end contractions. Mean discharge for October was estimated; mean for Nov. 1 to 28 estimated at 0.2 second-foot. There was no flow in 1911 after Aug. 2.

Monthly discharge of Willow Creek near Malheur, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
October	....	....	0.18	11
November	2.30	....	.31	18
December	5.60	0.65	2.91	179
January	50	1.1	4.0	246
February	60	3.1	7.4	411
March	400	3.2	59.7	3,670
April	12.6	1.4	4.4	262
May	3.8	.9	2.3	141
June	3.3	.0	1.0	60
July	2.5	.04	.41	25
The period	....	....	....	5,020

NOTE.—See footnote to table of daily discharge.

WILLOW CREEK NEAR BROGAN, OREG.[1]

Location.—In sec. 14 T. 15 S., R. 42 E., at the highway bridge near the Cole ranch; above the mouth of Pole Creek, and about 3 miles northwest of Brogan.

Records available.—May 12, 1904, to July 16, 1906; January 1, 1910, to June 30, 1911. The records for January 1 to March 20, 1910, were obtained at Dam No. 2 of the Willow Creek project in SW. ¼ sec. 27, T. 14 S., R. 42 E.

Drainage area.—Not measured.

Gage.—Staff gage unrelated to the gages used during 1904 to 1906.

Channel.—Shifting during flood stages.

Discharge measurements.—Made from the bridge or by wading.

Diversions.—Water is stored above the station in the reservoirs of the Willow Creek project.

Cooperation.—Record of daily gage heights and discharges and some of the discharge measurements published furnished by the James A. Green Engineering & Construction Co.

Discharge measurements of Willow Creek near Brogan, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 8	(a)	3.90	186	Apr. 26	G. L. Parker	.41	5.5
9	(a)	3.10	101	June 16	O. W. Hartwell	.06	.22
9	(a)	5.20	414				

[a] Made by engineers of the James A. Green Engineering & Construction Co., with a Lallie current meter and using rating furnished by makers.

Daily gage height, in feet, of Willow Creek near Brogan, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.
1	0.4	0.5	0.2	0.8	3.3	1.1	0.6	0.4	0.0
2	.4	.5	.2	.8	3.0	1.1	.6	.4	.0
3	.4	.4	.2	.8	2.0	1.2	.5	.4	.0
4	.4	.4	.2	1.0	1.7	2.3	.5	.4	.0
5	.4	.5	.2	1.1	2.0	3.0	.4	.4	.0
6	.4	.5	.2	1.1	2.0	5.1	.4	.4	.0
7	.4	.5	.2	1.2	1.8	6.9	.4	.4	.0
8	.4	.5	.2	1.2	2.0	4.4	.4	.4	.0
9	.4	.5	.2	1.2	2.0	3.1	.3	.4	.1
10	.4	.5	.2	1.1	2.3	3.0	.3	.4	.1
11	.4	.5	.2	.7	2.0	2.7	.3	.5	.1
12	.4	.5	.2	.7	1.0	2.8	.2	.5	.1
13	.4	.5	.2	1.5	2.0	2.6	.2	.5	.0
14	.4	.5	.2	1.2	1.6	2.4	.2	.5	.0
15	.4	.4	.2	1.4	1.7	2.3	.2	.6	.0
16	.4	.4	.2	1.4	1.6	2.0	.2	.6	.2
17	.4	.4	.2	1.0	1.4	1.2	.2	.6	.2
18	.4	.4	.2	.7	1.3	.9	.2	.6	.2
19	.4	.4	.2	1.1	1.2	.8	.2	.6	.2
20	.4	.5	.2	1.4	1.1	.7	.4	.6	.1
21	.4	.5	.4	.5	1.0	.7	.4	.6	.1
22	.4	.5	.1	1.5	1.0	.7	.4	.2	.1
23	.4	.5	.5	1.1	1.1	.8	.4	.2	.0
24	.4	.5	.4	2.2	1.1	.8	.4	.2	.0
25	.4	.5	.2	2.0	1.1	.8	.4	.1	.0
26	.4	.5	.0	2.1	1.1	.7	.4	.1	.0
27	.4	.5	.5	2.0	1.1	.7	.4	.1	.0
28	.4	.5	.0	2.1	1.1	.7	.4	.1	.0
29	.4	.5	.0	2.1	....	.7	.4	.1	.0
30	.4	.5	.8	2.0	....	.7	.4	.1	.0
31	.4	....	.8	1.7	....	.6	....	.1	....

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[1] Known as "Willow Creek near Dell" in reports for 1904 to 1906.

Daily discharge, in second-feet, of Willow Creek near Brogan, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.
1	1.5	2	0.5	3.8	120	5.2	10.5	5.5	0.0
2	1.5	2	.5	3.8	92	5.2	10.5	5.5	.0
3	1.5	1.5	.5	3.8	10	6.0	8.0	5.5	.0
4	1.5	1.5	.5	4.8	8.5	26	8.0	5.5	.0
5	1.5	2	.5	5.2	10	92	5.5	5.5	.0
6	1.5	2	.5	5.2	10	400	5.5	5.5	.0
7	1.5	2	.5	6.0	9.0	725	5.5	5.5	.0
8	1.5	2	.5	6.0	10	270	5.5	5.5	.0
9	1.5	2	.5	6.0	10	101	3.5	5.5	.5
10	1.5	2	.5	5.2	26	95	3.5	5.5	.5
11	1.5	2	.5	3.3	10	80	3.5	8.0	.5
12	1.5	2	.5	3.3	4.8	85	2.0	8.0	.5
13	1.5	2	.5	7.5	10	75	2.0	8.0	.0
14	1.5	2	.5	6.0	8.0	66	2.0	8.0	.0
15	1.5	1.5	.5	7.0	8.5	62	2.0	10.5	.0
16	1.5	1.5	.5	7.0	8.0	50	2.0	10.5	2.0
17	1.5	1.5	.5	4.8	7.0	26	2.0	10.5	2.0
18	1.5	1.5	.5	3.3	6.5	17.5	2.0	10.5	2.0
19	1.5	1.5	.5	5.2	6.0	15.5	2.0	10.5	2.0
20	1.5	2	.5	7.0	5.2	13	5.5	10.5	.5
21	1.5	2	1.8	2.2	4.8	13	5.5	10.5	.5
22	1.5	2	.2	7.5	4.8	13	5.5	2.0	.5
23	1.5	2	2.2	5.2	5.2	15.5	5.5	2.0	.0
24	1.5	2	1.8	20	5.2	15.5	5.5	2.0	.0
25	1.5	2	.5	10	5.2	15.5	5.5	.5	.0
26	1.5	2	.0	12	5.2	13	5.5	.5	.0
27	1.5	2	2.2	10	5.2	13	5.5	.5	.0
28	1.5	2	.0	12	5.2	13	5.5	.5	.0
29	1.5	2	.0	12	....	13	5.5	.5	.0
30	1.5	2	3.8	10	....	13	5.5	.5	.0
31	1.5	....	3.8	8.5	....	10.5	....	.5	....

NOTE.—The above records do not include 230 acre-feet used in Logan ditch Apr. 1 to July 1.

Monthly discharge of Willow Creek near Brogan, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
October	1.5	1.5	1.5	92.2
November	2.0	1.5	1.9	113
December	3.8	.0	.9	55.3
January	20	2.2	6.89	424
February	120	4.8	15.0	833
March	725	5.2	76.2	4,690
April	10.5	2.0	4.87	290
May	10.5	.5	5.48	337
June	2.0	.0	.38	22.6
The period				6,860

PAYETTE RIVER NEAR HORSE SHOE BEND, IDAHO.

Location.—In sec. 2, T. 7 N., R. 2 E., directly in front of E. R. Sherard's house, across the river from Jerusalem Valley, just below Brainard Creek and about 5 miles above Horse Shoe Bend post office. Shafer Creek and Squaw Creek are the main tributaries which enter below.

Records available.—February 13, 1906, to September 30, 1911.

Drainage area.—2,240 square miles.

Gage.—Sloping gage on right bank.

Channel.—Large gravel and rock; permanent under ordinary conditions.

Discharge measurements.—Made from a cable near the gage.

Diversions.—Few diversions above station.

Accuracy.—Rating curves well defined; records reliable.

Discharge measurements of Payette River near Horse Shoe Bend, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
June 13[a]	O. W. Hartwell	11.10	18,600
July 12	.....do	6.45	5,140
Aug. 30	Lynn Crandall	4.22	1,090

[a] Surface velocity measurement. A coefficient of 0.84 was used to reduce to mean velocity.

Daily gage height, in feet, of Payette River near Horse Shoe Bend, Idaho, for the year ending Sept. 30, 1911.

[E. R. Sherard, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	4.0	3.9	5.0	4.55	5.25	4.35	5.25	8.5	8.6	8.6	5.4	4.2
2	4.2	3.9	4.8	4.55	5.3	4.4	5.25	8.7	8.9	8.4	5.35	4.2
3	4.2	3.9	5.0	4.5	5.35	4.45	5.3	8.85	9.2	8.15	5.3	4.2
4	5.2	3.9	5.2	4.5	5.4	4.5	5.3	8.9	9.6	7.85	5.25	4.2
5	4.6	3.9	5.0	4.55	5.0	4.5	5.3	8.9	10.0	7.75	5.15	4.2
6	4.4	3.9	5.0	4.6	4.85	4.55	5.4	8.95	10.0	7.7	5.05	4.2
7	4.2	4.0	4.9	4.6	4.75	4.55	5.45	8.9	10.05	7.6	5.0	4.2
8	4.2	4.2	4.8	4.5	4.7	4.6	5.55	8.8	10.5	7.45	4.9	4.2
9	4.2	4.7	4.7	4.45	4.6	4.65	5.6	8.75	10.7	7.25	4.9	4.2
10	4.1	4.6	4.7	4.35	4.6	4.65	5.65	8.75	10.7	7.0	4.85	4.2
11	4.1	4.7	4.6	4.35	4.55	4.65	5.75	8.5	10.7	6.7	4.85	4.2
12	4.1	5.2	4.6	4.3	4.6	4.65	5.85	8.3	10.9	6.5	4.8	4.2
13	4.2	5.2	4.4	4.25	4.6	4.75	5.9	8.3	11.05	6.4	4.75	4.2
14	4.2	4.9	4.4	4.2	4.55	4.75	5.95	8.45	11.0	6.3	4.75	4.2
15	4.1	4.7	4.4	4.25	4.5	4.8	5.95	8.55	11.1	6.1	4.7	4.2
16	4.1	4.6	4.3	4.3	4.4	4.85	6.1	8.65	11.15	6.1	4.7	4.1
17	4.2	4.5	4.2	4.3	4.4	4.9	6.2	8.8	11.15	6.05	4.7	4.1
18	4.2	4.5	4.2	4.3	4.4	4.95	6.3	8.9	11.0	6.05	4.6	4.1
19	4.1	4.5	4.3	4.35	4.4	5.05	6.35	8.95	10.8	6.05	4.6	4.1
20	4.1	4.7	4.3	4.35	4.4	5.15	6.35	8.95	10.55	6.0	4.6	4.1
21	4.1	4.8	4.4	4.35	4.4	5.2	6.4	8.9	10.3	6.0	4.5	4.1
22	4.1	5.0	4.4	4.35	4.35	5.25	6.45	8.7	10.05	5.9	4.5	4.1
23	4.1	5.0	4.5	4.4	4.3	5.3	6.75	8.7	9.9	5.8	4.5	4.1
24	4.1	5.3	4.5	4.4	4.25	5.4	7.2	8.4	9.8	5.75	4.4	4.1
25	4.1	5.0	4.5	4.4	4.25	5.4	7.5	8.2	9.4	5.7	4.4	4.1
26	4.1	4.8	4.55	4.4	4.25	5.55	8.0	8.1	9.15	5.6	4.4	4.1
27	4.0	4.7	4.55	4.45	4.3	5.7	8.0	8.1	9.0	5.55	4.3	4.1
28	4.0	4.5	4.55	4.45	4.3	5.85	7.75	8.0	8.8	5.5	4.3	4.1
29	4.0	4.5	4.55	4.6	....	5.95	7.7	8.0	8.7	5.5	4.3	4.1
30	4.0	4.7	4.55	4.7	....	6.1	7.85	8.0	8.65	5.45	4.2	4.1
31	4.0	....	4.55	4.85	....	6.25	....	8.2	....	5.45	4.2	....

Daily discharge, in second-feet, of Payette River near Horse Shoe Bend, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	875	795	2,120	1,480	2,510	1,240	2,510	10,000	10,300	10,800	2,940	1,070
2	1,070	795	1,820	1,480	2,590	1,300	2,510	10,600	11,200	10,200	2,840	1,070
3	1,070	795	2,120	1,420	2,680	1,360	2,590	11,000	12,100	9,490	2,750	1,070
4	2,430	795	2,430	1,420	2,760	1,420	2,590	11,200	13,300	8,660	2,660	1,070
5	1,550	795	2,120	1,480	2,120	1,420	2,590	11,200	14,600	8,380	2,480	1,070
6	1,300	795	2,120	1,550	1,900	1,480	2,760	11,300	14,600	8,250	2,300	1,070
7	1,070	875	1,970	1,550	1,750	1,480	2,850	11,200	14,800	7,980	2,210	1,070
8	1,070	1,070	1,820	1,420	1,680	1,550	3,030	10,900	16,200	7,590	2,040	1,070
9	1,070	1,680	1,680	1,360	1,550	1,620	3,120	10,700	16,900	7,070	2,040	1,070
10	965	1,550	1,680	1,240	1,550	1,620	3,220	10,700	17,000	6,440	1,960	1,070
11	965	1,680	1,550	1,240	1,480	1,620	3,400	10,000	17,000	5,710	1,960	1,070
12	965	2,430	1,550	1,180	1,550	1,620	3,600	9,470	17,700	5,240	1,880	1,070
13	1,070	2,430	1,300	1,120	1,550	1,750	3,690	9,470	18,200	5,010	1,800	1,070
14	1,070	1,970	1,300	1,070	1,480	1,750	3,780	9,890	18,100	4,780	1,800	1,070
15	965	1,680	1,300	1,120	1,420	1,820	3,780	10,200	18,500	4,340	1,720	1,070
16	965	1,550	1,180	1,180	1,300	1,900	4,080	10,400	18,700	4,340	1,720	965
17	1,070	1,420	1,070	1,180	1,300	1,970	4,290	10,900	18,700	4,240	1,720	965
18	1,070	1,420	1,070	1,180	1,300	2,040	4,500	11,200	18,200	4,240	1,570	965
19	965	1,420	1,180	1,240	1,300	2,200	4,600	11,300	17,600	4,240	1,570	965
20	965	1,680	1,180	1,240	1,300	2,350	4,600	11,300	16,800	4,130	1,570	965
21	965	1,820	1,300	1,240	1,300	2,430	4,710	11,200	16,000	4,130	1,430	965
22	965	2,120	1,300	1,240	1,240	2,510	4,820	10,600	15,200	3,920	1,430	965
23	965	2,120	1,420	1,300	1,180	2,590	5,500	10,600	14,800	3,720	1,430	965
24	965	2,590	1,420	1,300	1,120	2,760	6,570	9,750	14,400	3,620	1,300	965
25	965	2,120	1,420	1,300	1,120	2,760	7,320	9,190	13,200	3,520	1,300	965
26	965	1,820	1,480	1,300	1,120	3,030	8,630	8,910	12,400	3,320	1,300	965
27	875	1,680	1,480	1,360	1,180	3,310	8,630	8,910	12,000	3,220	1,180	965
28	875	1,420	1,480	1,360	1,180	3,600	7,970	8,630	11,400	3,130	1,180	965
29	875	1,420	1,480	1,550	....	3,780	7,840	8,630	11,100	3,130	1,180	965
30	875	1,680	1,480	1,680	....	4,080	8,230	8,630	10,900	3,040	1,070	965
31	875	....	1,480	1,900	....	4,400	....	9,190	....	3,040	1,070	....

NOTE.—Discharge determined as follows: Oct. 1 to June 6, from a rating curve well defined below 14,000 second-feet; June 7 to 21 by shifting-channel methods; June 22 to Sept. 30, from a rating curve well defined below 8,000 second-feet and fairly well defined between 8,000 and 14,000 second-feet.

Monthly discharge of Payette River near Horse Shoe Bend, Idaho, for the year ending Sept. 30, 1911.

[Drainage area, 2,240 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	2,430	875	1,060	0.473	0.55	65,200	A.
November	2,590	795	1,550	.692	.77	92,200	A.
December	2,430	1,070	1,560	.696	.80	95,900	A.
January	1,900	1,070	1,340	.598	.69	82,400	A.
February	2,760	1,120	1,590	.710	.74	88,300	A.
March	4,400	1,240	2,220	.991	1.14	136,000	B.
April	8,630	2,510	4,610	2.06	2.30	274,000	B.
May	11,300	8,630	10,200	4.55	5.25	627,000	B.
June	18,700	10,300	15,100	6.74	7.52	898,000	B.
July	10,800	3,040	5,450	2.43	2.80	335,000	A.
August	2,940	1,070	1,790	.799	.92	110,000	A.
September	1,070	965	1,020	.455	.51	60,700	A.
The year	18,700	795	3,960	1.77	23.99	2,860,000	

NORTH FORK OF PAYETTE RIVER AT LARDO, IDAHO.

Location.—In sec. 8, T. 18 N., R. 3 E. Boise meridian, about one-fourth mile below the outlet of Big Payette Lake and about the same distance from Lardo post office. No tributaries between the lake and the gage.

Records available.—September 1, 1908, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Original temporary gage, established August 25, 1908, was about 1¼ miles below the lake. Permanent gage, installed at present location on October 14, 1908, a vertical staff on the left bank. Datum of this gage remained unchanged. A new sloping gage was installed at same datum but about 30 feet upstream, July 25, 1911.

Channel.—Stream bed of fairly large stones; practically permanent.

Discharge measurements.—Wading during low water; from a cable about one-half mile below the gage at high stages.

Accuracy.—Rating curve well defined; records good.

Discharge measurements of North Fork of Payette River at Lardo, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 3	O. W. Hartwell	1.52	19	May 11	J. C. Dort	4.22	1,050
Nov. 3	Lynn Crandall	1.30	7.4	June 3	do	5.90	2,280
3	do	1.28	7.1	25	O. W. Hartwell	5.60	2,290
				July 23	do	3.00	291
1911.				25	do	2.88	246
May 10	J. C. Dort	4.35	1,110	Sept. 11	Lynn Crandall	1.90	39.0

Daily gage height, in feet, of North Fork of Payette River at Lardo, Idaho, for the year ending Sept. 30, 1911.

[Neal Boydstun, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.45	1.25	2.6	2.1	2.4	2.15	2.55	4.0	4.95	5.3	2.5	2.0
2	1.45	1.15	2.55	2.1	2.45	2.15	2.55	4.1	5.3	5.0	2.45	2.0
3	1.5	1.3	2.55	2.1	2.5	2.2	2.55	4.2	5.7	4.8	2.45	1.95
4	1.55	1.25	2.55	2.1	2.5	2.2	2.55	4.3	6.0	4.6	2.4	1.95
5	1.55	1.35	2.55	2.1	2.5	2.2	2.6	4.4	6.3	4.45	2.4	1.95
6	1.55	1.4	2.5	2.1	2.5	2.2	2.6	4.45	6.5	4.3	2.4	1.95
7	1.55	1.5	2.5	2.1	2.45	2.2	2.6	4.5	6.8	4.2	2.3	1.95
8	1.55	1.55	2.5	2.1	2.45	2.2	2.65	4.55	7.0	4.05	2.3	1.95
9	1.55	1.65	2.5	2.1	2.45	2.2	2.65	4.5	7.0	3.9	2.25	1.95
10	1.55	1.8	2.45	2.15	2.4	2.2	2.7	4.35	6.6	3.8	2.25	1.9
11	1.55	1.95	2.45	2.15	2.4	2.2	2.7	4.2	6.4	3.75	2.25	1.9
12	1.55	2.1	2.45	2.2	2.4	2.2	2.7	4.2	6.5	3.65	2.25	1.9
13	1.55	2.05	2.4	2.25	2.4	2.2	2.7	4.2	6.7	3.55	2.25	1.9
14	1.55	2.05	2.4	2.25	2.45	2.25	2.7	4.15	6.9	3.5	2.25	1.85
15	1.55	2.05	2.35	2.25	2.45	2.25	2.7	4.2	7.0	3.45	2.2	1.8
16	1.55	2.1	2.3	2.25	2.45	2.25	2.7	4.25	7.2	3.4	2.2	1.75
17	1.55	2.1	2.25	2.25	2.45	2.3	2.7	4.3	7.3	3.35	2.2	1.65
18	1.55	2.15	2.2	2.3	2.45	2.3	2.75	4.45	7.1	3.3	2.2	1.6
19	1.6	2.15	2.1	2.3	2.4	2.35	2.75	4.35	6.8	3.25	2.15	1.55
20	1.6	2.2	2.1	2.3	2.4	2.35	2.8	4.25	6.55	3.2	2.15	1.5
21	1.6	2.25	2.1	2.3	2.35	2.35	2.85	4.15	6.35	3.1	2.15	1.45
22	1.6	2.3	2.1	2.3	2.3	2.4	2.85	4.2	6.1	3.05	2.1	1.45
23	1.65	2.3	2.1	2.3	2.25	2.4	2.95	4.2	5.9	3.0	2.1	1.4
24	1.65	2.35	2.05	2.3	2.2	2.45	3.0	4.25	5.9	2.95	2.05	1.35
25	1.6	2.4	2.05	2.3	2.2	2.45	3.15	4.25	5.7	2.9	2.05	1.35
26	1.6	2.4	2.05	2.3	2.2	2.45	3.3	4.25	5.6	2.85	2.05	1.35
27	1.6	2.45	2.05	2.3	2.15	2.45	3.4	4.3	5.5	2.8	2.05	1.3
28	1.55	2.5	2.05	2.3	2.15	2.45	3.5	4.3	5.55	2.75	2.05	1.3
29	1.5	2.55	2.05	2.3	......	2.5	3.6	4.45	5.55	2.65	2.0	1.35
30	1.4	2.55	2.1	2.35	......	2.5	3.8	4.6	5.4	2.6	2.0	1.35
31	1.3	......	2.1	2.4	......	2.5	......	4.75	......	2.55	2.0	......

Daily discharge, in second-feet, of North Fork of Payette River at Lardo, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	14	60	173	71	125	79	160	855	1,660	2,000	141	49
2	14	40	150	71	136	79	160	930	2,000	1,710	130	49
3	16	74	160	71	148	87	160	1,010	2,400	1,520	130	44
4	20	60	160	71	148	87	160	1,090	2,700	1,340	118	44
5	20	92	160	71	148	87	173	1,180	3,020	1,220	118	44
6	20	11	148	71	148	87	173	1,220	3,220	1,090	118	44
7	20	16	148	71	136	87	173	1,260	3,540	1,010	97	44
8	20	20	148	71	136	87	186	1,300	3,760	892	97	44
9	20	26	148	71	136	87	186	1,260	3,760	780	88	44
10	20	38	136	79	125	87	200	1,130	3,330	710	88	39
11	20	52	136	79	125	87	200	1,010	3,120	678	88	39
12	20	71	136	87	125	87	200	1,010	3,220	612	88	39
13	20	64	125	96	125	87	200	1,010	3,440	550	88	39
14	20	64	125	96	136	96	200	970	3,650	520	88	35
15	20	64	115	96	136	96	200	1,010	3,760	492	78	31
16	20	71	105	96	136	96	200	1,050	3,980	465	78	28
17	20	71	96	96	136	105	200	1,090	4,090	440	78	21
18	20	79	87	105	136	105	214	1,220	3,870	415	78	18
19	23	79	71	105	125	115	214	1,130	3,540	392	70	16
20	23	87	71	105	125	115	229	1,050	3,280	370	70	13
21	23	96	71	105	115	115	244	970	3,070	329	70	11
22	23	105	71	105	105	125	244	1,010	2,800	310	62	11
23	26	105	71	105	96	125	278	1,010	2,600	291	62	9
24	26	115	64	105	87	136	295	1,050	2,600	274	56	7.5
25	23	125	64	105	87	136	356	1,050	2,400	256	56	7.5
26	23	125	64	105	87	136	424	1,050	2,300	240	56	7.5
27	23	136	64	105	79	136	474	1,090	2,200	224	56	6
28	20	148	64	105	79	136	528	1,090	2,240	209	56	6
29	16	160	64	105	......	148	585	1,220	2,240	180	49	7.5
30	11	160	71	115	......	148	710	1,340	2,100	166	49	7.5
31	74	......	71	125	......	148	......	1,480	......	154	49	......

NOTE.—Discharge determined as follows: Oct. 1 to Apr. 30, from a rating curve well defined above 100 second-feet and fairly well defined between 5 and 100 second-feet; May 1 to Sept. 30, from a rating curve well defined above 30 second-feet.

Monthly discharge of North Fork of Payette River at Lardo, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	26	7.4	19.7	1,210	B.
November	160	4.0	70.7	4,210	B.
December	173	64	108	6,640	A.
January	125	71	92.4	5,680	A.
February	148	79	122	6,780	A.
March	148	79	107	6,580	A.
April	710	160	264	15,700	A.
May	1,480	855	1,100	67,600	A.
June	4,090	1,660	3,000	179,000	A.
July	2,000	154	640	39,400	A.
August	141	49	82.3	5,060	A.
September	49	6	26.8	1,590	B.
The year	4,090	4.0	468	339,000	

LAKE FORK OF PAYETTE RIVER NEAR McCALL, IDAHO.

Location.—In sec. 13, T. 18 N., R. 3 E. Boise meridian, at Waine's ranch, about one-fourth mile below the outlet to Little Payette Lake, and about 3 miles east of McCall. No tributaries between the lake and the gage.

Records available.—September 28, 1909, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on left bank; new gage installed same site and same datum as old one November 4, 1910.

Channel.—Fine gravel. Controlled by a rough diversion dam and ditch headgates about one-fourth mile below.

Discharge measuremnts.—Made from cable about 200 feet below gage and, when stage permits, by wading.

Diversions.—A ditch for irrigation in Long Valley diverts water about one-fourth mile below gage.

Accuracy.—Rating curve well defined; records good.

Discharge measurements of Lake Fork of Payette River near McCall, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 3	O. W. Hartwell	0.81	23	May 12	J. C. Dort	3.08	355
Nov. 4	Lynn Crandall	.89	29	June 3	.....do	4.82	1,030
4	.....do	.88	28	25	O. W. Hartwell	4.10	677
				July 24	.....do	1.85	115
1911.				Sept. 11	Lynn Crandall	.84	22.5
May 11	J. C. Dort	3.08	360				

Daily gage height, in feet, of Lake Fork of Payette River near McCall, Idaho, for the year ending Sept. 30, 1911.

[Andrew Waine, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.65	0.95	1.8	1.15	1.21	1.18	1.70	3.10	4.00	4.00	1.48	0.82
2	.8	.95	1.8	1.15	1.20	1.17	1.90	3.10	4.50	3.89	1.45	.80
3	.8	.95	1.8	1.14	1.20	1.16	1.95	3.50	4.80	3.58	1.42	.80
4	1.1	1.0	1.75	1.14	1.20	1.15	2.00	3.55	4.85	3.50	1.40	.78
5	1.1	1.0	1.75	1.14	1.19	1.16	2.00	4.10	4.90	3.40	1.39	.77
6	1.1	1.0	1.75	1.13	1.18	1.17	1.91	4.10	4.95	3.35	1.35	.76
7	1.1	1.0	1.75	1.13	1.18	1.20	1.90	3.60	5.00	3.30	1.30	.75
8	1.1	1.0	1.75	1.13	1.18	1.23	1.90	3.60	5.10	3.25	1.26	.91
9	1.1	1.1	1.7	1.12	1.19	1.23	1.90	3.60	5.00	3.15	1.25	.91
10	1.1	1.25	1.7	1.13	1.19	1.21	1.90	3.55	4.70	3.00	1.20	.90
11	1.0	1.5	1.6	1.14	1.20	1.20	1.90	3.10	5.00	2.95	1.20	.90
12	1.0	2.05	1.6	1.14	1.20	1.19	1.90	3.10	5.50	2.90	1.15	.80
13	1.0	2.0	1.6	1.15	1.20	1.18	1.87	3.13	5.90	2.75	1.14	.80
14	1.0	2.0	1.6	1.15	1.19	1.17	1.86	3.20	5.80	2.62	1.13	.78
15	1.0	2.0	1.6	1.16	1.19	1.16	1.86	3.15	5.80	2.59	1.10	.75
16	1.0	2.0	1.55	1.16	1.19	1.15	1.80	3.85	5.85	2.50	1.08	.75
17	1.05	2.0	1.45	1.17	1.20	1.14	1.80	3.95	5.50	2.40	1.06	.65
18	1.05	2.0	1.4	1.17	1.20	1.14	1.80	3.75	5.30	2.33	1.05	.65
19	1.05	2.0	1.45	1.18	1.20	1.15	1.85	3.55	5.30	2.30	1.04	.67
20	1.0	1.95	1.35	1.19	1.20	1.18	1.85	3.43	5.30	2.20	1.02	.67
21	1.0	2.0	1.3	1.20	1.20	1.12	1.89	3.31	5.00	2.10	1.00	.67
22	1.0	2.0	1.15	1.21	1.21	1.25	2.00	3.25	4.80	2.05	.98	.67
23	1.0	2.0	1.0	1.22	1.21	1.35	2.17	3.20	4.80	1.78	.97	.67
24	1.0	2.0	.95	1.23	1.20	1.50	2.50	3.30	4.48	1.73	.96	.66
25	1.0	2.0	.9	1.24	1.20	1.50	2.90	3.35	4.03	1.71	.94	.66
26	1.0	2.0	.85	1.24	1.20	1.50	3.15	3.35	3.78	1.60	.93	.65
27	1.0	1.95	.85	1.24	1.19	1.50	3.40	3.25	3.62	1.58	.90	.66
28	1.0	1.95	.9	1.23	1.19	1.59	3.35	3.20	4.50	1.55	.86	.50
29	1.0	1.95	.9	1.22	......	1.48	3.20	3.35	4.30	1.51	.85	.40
30	1.0	1.95	.95	1.21	......	1.47	3.00	3.50	4.10	1.51	.85	.30
31	.95	......	.95	1.21	......	1.46	......	3.75	......	1.50	.84	......

Daily discharge, in second-feet, of Lake Fork of Payette River near McCall, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	17	32	106	44	49	47	94	362	642	642	71	25
2	24	32	106	44	48	46	119	362	858	600	68	24
3	24	32	106	44	48	45	126	472	1,010	496	66	24
4	41	35	100	44	48	44	133	487	1,040	472	64	23
5	41	35	100	44	47	45	133	682	1,070	443	63	22
6	41	35	100	43	47	46	120	682	1,100	429	60	22
7	41	35	100	43	47	48	119	502	1,130	415	56	22
8	41	35	100	43	47	50	119	502	1,190	402	53	30
9	41	41	94	42	47	50	119	502	1,130	375	52	30
10	41	52	94	43	47	49	119	487	960	336	48	29
11	35	73	83	44	48	48	119	362	1,130	324	48	29
12	35	140	83	44	48	47	119	362	1,460	311	44	24
13	35	133	83	44	48	47	115	370	1,760	276	44	24
14	35	133	83	44	47	46	114	388	1,680	246	43	23
15	35	133	83	45	47	45	114	375	1,680	240	41	22
16	35	133	78	45	47	44	106	586	1,720	221	40	22
17	38	133	68	46	48	44	106	623	1,460	201	39	17
18	38	133	64	46	48	44	106	551	1,320	188	38	17
19	38	133	68	47	48	44	112	487	1,320	182	37	18
20	35	126	60	47	48	47	112	452	1,320	164	36	18
21	35	133	56	48	48	42	118	418	1,130	148	35	18
22	35	133	44	49	49	52	133	402	1,010	140	34	18
23	35	133	35	50	49	60	159	388	1,010	104	33	18
24	35	133	32	50	48	73	221	415	848	98	33	17
25	35	133	29	51	48	73	311	429	654	95	31	17
26	35	133	26	51	48	73	375	429	561	83	31	17
27	35	126	26	51	47	73	443	402	508	81	29	17
28	35	126	29	50	47	82	429	388	858	78	27	11
29	35	126	29	50	....	71	388	429	764	74	26	8
30	35	126	32	49	....	70	336	472	682	74	26	5
31	32	....	32	49	....	69	....	551	....	73	26	....

NOTE.—Discharged determined from a rating curve well defined between 20 and 1,400 second-feet.

Monthly discharge of Lake Fork of Payette River near McCall, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	41	17	35.3	2,170	A.
November	140	32	97.9	5,830	A.
December	106	26	68.7	4,220	A.
January	51	42	46.3	2,850	A.
February	49	47	47.7	2,650	A.
March	82	42	53.7	3,300	A.
April	443	94	175	10,400	A.
May	682	362	462	28,400	A.
June	1,760	508	1,100	65,500	A.
July	642	73	258	15,900	A.
August	71	26	43.3	2,660	A.
September	30	5	20.4	1,210	B.
The year	1,760	5	200	145,000	

WEISER RIVER NEAR WEISER, IDAHO.

Location.—In sec. 35, T. 11 N., R. 4 W. Boise meridian, a short distance below a section house of the Pacific & Idaho Northern Railroad, above the headworks of the Galloway ditch, about 10 miles above Weiser, and at approximately same site as old station discontinued in 1904. Below all main tributaries except Mann Creek, which enters about 5 miles below, and Monroe Creek entering about 10 miles below the station.

Records available.—December 6, 1894, to December 31, 1904; October 7, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Inclined staff on right bank about 500 feet below the section house of the Pacific & Idaho Northern Railroad.

Channel.—Large gravel; probably fairly permanent.

Discharge measurements.—Made from a cable at the gage. Low-stage measurements can be made by wading.

Winter flow.—Gage heights affected to some extent by ice.

Diversions.—Above all large diversions from the river. Some water is used in the valleys but mostly from tributaries.

Accuracy.—Summer records affected by a temporary diversion dam below and are approximate at times.

Discharge measurements of Weiser River near Weiser, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 26[a]	Lynn Crandall	3.54	318	July 8	O.W. Hartwell	3.16	595
Feb. 15	do	3.08	530	26	do	3.23	60.8
June 9	J. C. Dort	6.30	3,940	Aug. 25	Lynn Crandall	2.57	19.7
21	O.W. Hartwell	4.61	1,810	Sept. 14	do	2.68	30.2

[a] Ice present at gage; averaged about 0.5 foot in thickness.

Daily gage height, in feet, of Weiser River near Weiser, Idaho, for the year ending Sept. 30, 1911.

[C. A. Norris, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July	Aug.	Sept.
1		2.5	4.3	3.0	7.7	3.0	5.0	4.80	5.05	4.10	3.00	2.60
2		2.5	3.9	3.6	6.7	3.1	5.35	4.85	5.50	3.80	3.00	2.60
3		2.4	3.8	2.7	5.2	3.0	5.35	4.95	5.80	3.65	3.10	2.60
4		2.5	7.6	2.8	4.8	3.0	5.15	5.25	5.75	3.60	3.10	2.60
5		3.5	6.1	2.8	4.35	3.1	4.95	5.25	5.60	3.45	2.90	2.60
6		2.5	4.8	2.8	4.05	2.9	4.65	5.60	5.35	3.40	2.90	2.60
7	2.5	2.5	4.1	2.8	3.65	4.3	4.45	5.65	5.45	3.25	2.80	2.60
8	2.4	2.6	4.0	2.9	3.55	6.15	4.30	5.30	6.55	3.20	2.90	2.60
9	2.4	2.7	3.8	2.8	3.5	5.75	4.35	5.00	6.30	3.10	2.90	2.70
10	2.4	3.0	3.9	2.8	3.5	5.7	4.50	4.95	6.00	3.00	2.90	2.80
11	2.3	3.0	3.7	2.8	3.5	6.1	4.40	4.75	5.85	2.95	2.90	2.80
12	2.3	3.1	4.2	3.0	3.5	5.7	4.30	4.75	5.9	2.90	2.90	2.80
13	2.3	3.4	4.1	3.0	3.3	5.65	4.15	4.60	5.85	2.85	2.90	2.80
14	2.3	3.0	3.9	3.0	3.3	5.65	4.00	4.65	5.75	3.10	2.90	2.70
15	2.3	2.8	3.7	3.0	3.2	5.7	3.90	4.65	5.65	3.30	2.90	2.70
16	2.3	2.7	3.5	2.7	3.1	5.75	3.8	5.15	5.50	3.20	2.90	2.70
17	2.3	2.6	3.4	2.8	3.3	5.65	3.8	5.75	5.30	2.90	2.80	2.70
18	2.4	2.6	3.3	2.7	3.0	5.8	3.95	5.90	5.05	2.80	2.80	2.70
19	2.6	2.6	3.2	3.2	3.1	5.55	4.10	6.15	4.95	2.80	2.60	2.70
20	2.6	2.7	3.2	3.2	3.1	5.55	4.05	6.00	4.80	3.00	2.60	2.80
21	2.5	2.7	3.0	2.9	3.2	5.65	4.05	5.55	4.65	2.90	2.60	2.80
22	2.5	3.7	3.0	3.2	3.0	5.8	4.10	5.35	4.95	3.40	2.60	2.80
23	2.4	3.9	2.8	3.2	2.9	5.75	4.15	5.30	4.45	3.30	2.60	2.80
24	2.4	4.6	3.0	3.2	2.9	5.9	4.40	5.20	4.30	3.30	2.60	2.80
25	2.5	3.7	3.0	3.2	2.9	5.8	4.75	5.10	4.15	3.30	2.60	2.80
26	2.5	3.7	3.1	3.5	2.9	5.25	5.05	4.95	3.85	3.30	2.60	2.80
27	2.5	3.3	2.9	3.5	2.8	4.95	5.20	4.90	3.80	3.30	2.60	2.80
28	2.5	3.0	2.9	3.5	2.8	4.65	5.25	4.80	4.25	3.30	2.60	2.80
29	2.5	3.5	3.0	3.4		4.5	5.10	4.75	4.05	3.20	2.60	2.80
30	2.5	4.6	2.9	4.3		4.5	4.90	4.75	4.40	3.00	2.60	2.80
31	2.5		2.9	7.0		4.8		4.90		3.00	2.60	

NOTE.—Gage heights probably affected by ice Jan. 1 to 2, 12 to 15, and 19 to 29. Gage heights July 14 to Sept. 30 variously affected by a temporary diversion dam below the gage.

Daily discharge, in second-feet, of Weiser River near Weiser, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	279	1,500	400	6,010	500	2,250	2,030	2,310	1,310	32	20
2	......	279	1,140	400	4,510	550	2,680	2,080	2,870	1,050	32	20
3	......	243	1,050	361	2,490	500	2,680	2,200	3,260	930	45	20
4	......	279	5,860	405	2,030	500	2,430	2,550	3,200	890	45	20
5	......	279	3,670	405	1,550	550	2,200	2,870	3,000	772	22	20
6	......	279	2,030	405	1,260	451	1,860	3,000	2,680	735	22	20
7	279	279	1,310	405	930	1,500	1,650	3,060	2,800	635	14	20
8	243	319	1,220	451	850	3,740	1,500	2,610	4,300	605	22	20
9	243	361	1,050	405	810	3,200	1,550	2,250	3,950	550	22	30
10	243	500	1,140	405	810	3,130	1,700	2,200	3,530	500	22	42
11	210	500	970	405	810	3,670	1,600	1,980	3,320	476	22	42
12	210	550	1,400	395	810	3,130	1,500	1,980	3,390	451	22	42
13	210	735	1,310	390	665	3,060	1,360	1,810	3,320	428	22	42
14	210	500	1,140	380	665	3,060	1,220	1,860	3,200	390	22	30
15	210	405	970	370	605	3,130	1,140	1,860	3,060	350	22	30
16	210	361	810	361	550	3,200	1,050	2,420	2,870	310	22	30
17	210	319	735	405	665	3,060	1,050	3,200	2,610	270	21	30
18	243	319	665	361	500	3,260	1,180	3,390	2,310	230	21	30
19	319	319	605	360	550	2,940	1,310	3,740	2,200	190	20	30
20	319	361	605	350	550	2,940	1,260	3,530	2,030	150	20	42
21	279	361	500	340	605	3,060	1,260	2,940	1,860	120	20	42
22	279	970	500	330	500	3,260	1,310	2,680	2,200	93	20	42
23	243	1,140	405	330	451	3,200	1,360	2,610	1,650	75	20	42
24	243	1,810	500	320	451	3,390	1,600	2,490	1,500	75	20	42
25	279	970	500	320	451	3,260	1,980	2,370	1,360	75	20	42
26	279	970	550	310	451	2,550	2,310	2,200	1,090	75	20	42
27	279	665	451	310	405	2,200	2,490	2,140	1,050	75	20	42
28	279	500	451	310	405	1,860	2,680	2,030	1,450	75	20	42
29	279	810	500	270	......	1,700	2,370	1,980	1,260	60	20	42
30	279	1,810	451	1,500	......	1,700	2,140	1,980	1,600	32	20	42
31	279	......	451	4,960	......	2,030	......	2,140	......	32	20	......

NOTE.—Discharge Oct. 7 to July 13, except as noted below, determined from a rating curve well defined above 450 second-feet. Discharges estimated on account of ice for Jan. 1 to 2, 12 to 15, and 19 to 29. Discharge July 14 to Sept. 30 obtained by indirect methods, using short curves, measurements, and information concerning condition of temporary diversion dam.

Monthly discharge of Weiser River near Weiser, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October 7-31	319	210	254	12,600	B.
November	1,810	243	582	34,600	A.
December	5,860	405	1,110	68,200	A.
January	4,960	270	552	33,900	C.
February	6,010	405	1,120	62,200	A.
March	3,740	451	2,400	148,000	A.
April	2,680	1,050	1,760	105,000	A.
May	3,740	1,810	2,460	151,000	A.
June	4,300	1,050	2,510	149,000	A.
July	1,310	32	387	23,800	C.
August	45	14	23.0	1,410	B.
September	42	20	33.3	1,980	B.
The period	....	....	....	792,000	

WEST FORK OF WEISER RIVER NEAR FRUITVALE, IDAHO.

Location.—In sec. 9, T. 17 N., R. 1 W. Boise meridian, at Walker's ranch, about 1½ miles northwest from Fruitvale post office, which is at the junction of the West Fork and Weiser River.

Records available.—October 5, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on left bank a short distance above Walker's house.

Channel.—Gravel bottom and mud; logs are laid across at a ford below the gage at certain times and cause backwater at gage.

Discharge measurements.—Made from a suspension footbridge just below the gage, or, when stage will permit, by wading.

Winter flow.—Not seriously affected by ice.

Diversions.—Small ranch ditches divert water from the stream.

Accuracy.—Rating curves fairly well defined; results fairly reliable.

Discharge measurements of West Fork of Weiser River near Fruitvale, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 5	O. W. Hartwell	2.60	21.0	Apr. 21	A. B. Purton	4.10	174
Nov. 7	Lynn Crandall	2.53	12.7	May 13	J. C. Dort	4.41	241
Dec. 29	.....do	2.70	20.5	June 2	.....do	4.20	208
				24	O. W. Hartwell	2.88	38.2
1911.				July 22	.....do	2.18	1.7
Jan. 30[a]	Lynn Crandall	2.68	18.6	Sept. 12	Lynn Crandall	2.39	4.4
Feb. 14	.....do	2.83	30.3				

[a] Ice cover at the gage, but control open.

Daily gage height, in feet, of West Fork of Weiser River near Fruitvale, Idaho, for the year ending Sept. 30, 1911.

[Hugh Walker, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	2.4	2.8	2.7	3.3	2.9	5.0	4.7	4.1	2.6	2.4	2.2
2	......	2.5	2.9	2.7	3.0	2.8	5.0	4.8	4.2	2.6	2.4	2.2
3	......	2.5	2.9	2.7	3.1	2.9	4.8	4.9	4.1	2.6	2.5	2.2
4	......	2.4	3.4	2.7	3.1	2.9	4.65	4.9	4.1	2.5	2.5	2.3
5	2.6	2.3	3.1	2.7	2.9	3.0	4.4	4.9	4.1	2.5	2.5	2.3
6	2.5	2.4	2.9	2.7	2.9	3.0	4.3	4.9	4.1	2.5	2.5	2.4
7	2.5	2.5	2.9	2.7	3.3	3.0	4.2	4.8	4.2	2.4	2.5	2.4
8	2.5	2.5	2.8	2.7	3.1	3.1	4.1	4.7	4.3	2.4	2.4	2.4
9	2.4	2.5	2.9	2.5	3.1	3.2	4.4	4.7	4.3	2.4	2.6	2.4
10	2.4	2.6	2.7	2.6	2.9	3.2	4.3	4.7	4.2	2.4	2.6	2.4
11	2.4	3.0	2.9	2.6	3.0	3.2	4.2	4.5	4.1	2.3	2.5	2.4
12	2.4	3.2	2.8	2.6	3.0	3.2	4.2	4.5	4.1	2.3	2.5	2.4
13	2.5	2.8	2.7	2.6	2.8	3.3	4.0	4.4	4.1	2.3	2.5	2.3
14	2.5	2.7	2.7	2.6	2.8	3.4	3.8	4.3	4.1	2.3	2.5	2.3
15	2.5	2.6	2.6	2.7	3.0	3.9	3.8	4.4	4.0	2.3	2.5	2.2
16	2.5	2.6	2.7	2.7	3.1	3.95	3.7	4.6	4.0	2.3	2.5	2.2
17	2.5	2.6	2.8	2.7	3.0	4.0	3.9	4.6	3.9	2.2	2.6	2.2
18	2.5	2.6	2.7	2.7	2.7	4.0	4.1	4.8	3.8	2.15	2.5	2.2
19	2.5	2.5	2.6	2.65	2.8	4.4	4.0	4.9	3.7	2.1	2.5	2.2
20	2.5	2.5	2.6	2.7	2.8	4.4	4.1	4.8	3.7	2.1	2.4	2.3
21	2.5	2.6	2.6	2.6	2.6	4.5	4.1	4.7	3.7	2.1	2.3	2.3
22	2.5	2.5	2.5	2.6	2.9	4.6	4.2	4.6	3.7	2.1	2.3	2.3
23	2.5	2.7	2.8	2.6	2.9	4.8	4.4	4.6	3.7	2.0	2.3	2.3
24	2.5	2.6	2.6	2.8	2.9	4.7	4.6	4.5	2.9	2.0	2.4	2.3
25	2.5	2.6	2.8	2.9	2.9	4.4	4.9	4.5	2.7	2.0	2.3	2.3
26	2.5	2.5	2.9	2.8	2.8	4.4	5.0	4.4	2.7	2.0	2.3	2.3
27	2.5	2.6	2.6	2.9	3.0	4.0	5.1	4.4	2.7	2.0	2.3	2.3
28	2.5	2.7	2.8	2.7	2.9	3.8	5.1	4.3	2.6	2.3	2.3	2.4
29	2.4	2.7	2.6	2.7	......	3.9	4.8	4.2	2.6	2.4	2.3	2.4
30	2.4	2.8	2.6	2.75	......	4.3	4.8	4.2	2.6	2.4	2.3	2.4
31	2.4	......	2.7	3.1	......	4.7	......	4.1	......	2.4	2.2	......

Daily discharge, in second-feet, of West Fork of Weiser River near Fruitvale, Idaho., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	9	32	20	77	37	391	309	181	17	5	1
2	......	14	40	20	47	28	391	335	199	17	5	1
3	......	14	40	20	57	37	335	362	181	17	9	1
4	......	9	88	20	57	37	297	362	181	11	9	2.5
5	21	5.5	58	20	37	47	240	362	181	11	9	2.5
6	14	9	40	20	37	47	219	362	181	11	9	5
7	14	11	40	20	77	47	199	335	199	7	9	5
8	14	11	32	20	57	57	181	309	219	7	5	5
9	9	11	40	9	57	67	240	309	219	7	14	5
10	9	17	24	14	37	67	219	309	199	7	14	5
11	9	49	40	14	47	67	199	262	181	4	9	5
12	9	68	32	14	47	67	199	262	181	4	9	5
13	14	32	24	14	28	77	165	240	181	4	9	2.5
14	14	24	24	14	28	88	136	219	181	4	9	2.5
15	14	17	17	20	47	99	136	240	165	4	9	1
16	14	17	24	20	57	158	123	285	165	4	9	1
17	14	17	32	20	47	165	150	285	150	2	14	1
18	14	17	24	20	20	165	181	335	136	1.5	9	1
19	14	11	17	17	28	240	165	362	123	1	9	1
20	14	11	17	20	28	240	181	335	123	1	5	2.5
21	14	17	17	14	14	262	181	309	123	1	2.5	2.5
22	14	11	11	14	37	285	199	285	123	1	2.5	2.5
23	14	24	32	14	37	335	240	285	123	.5	2.5	2.5
24	14	17	17	28	37	309	285	262	40	.5	5	2.5
25	14	17	32	37	37	240	362	262	24	.5	2.5	2.5
26	14	11	37	28	28	240	391	240	24	.5	2.5	2.5
27	14	17	14	37	47	165	420	240	24	.5	2.5	2.5
28	14	24	28	20	37	136	420	219	17	2.5	2.5	5
29	9	24	14	20	....	150	335	199	17	5	2.5	5
30	9	32	20	24	....	219	335	199	17	5	2.5	5
31	9	....	20	57	....	309	....	181	....	5	1.0	....

NOTE.—Discharge determined as follows: Oct. 5 to Nov. 6 from a fairly well defined rating curve; Nov. 7 to Dec. 25 and Mar. 15 to July 27 from a well-defined rating curve; Dec. 26 to Mar. 14 from a well-defined rating curve.

Monthly discharge of West Fork of Weiser River near Fruitvale, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October 5–31	21	9	13.0	697	B.
November	68	5.5	18.9	1,120	B.
December	88	11	29.7	1,830	B.
January	57	9	20.9	1,290	B.
February	77	14	42.5	2,360	A.
March	335	28	146	8,980	A.
April	420	123	250	14,900	A.
May	362	181	286	17,600	A.
June	219	17	135	8,030	A.
July	17	.5	5.27	324	B.
August	14	1.0	6.69	411	B.
September	5	1.0	2.93	174	B.
The period	....	....	....	57,700	

LOST CREEK NEAR TAMARACK, IDAHO.

Location.—In sec. 28, T. 19 N., R. 1 W. Boise meridian, about one-fourth mile below the dam of the Lost Valley reservoir, 6 miles southwest of Tamarack post office, and 20 miles north of Council.

Records available.—Gage-height records obtained at the gaging station only for part of 1911, but total run-off for 1910 and 1911 has been computed from data furnished by the Weiser Valley Land & Water Co. The tables of total run-off are published herewith in addition to the data obtained directly at the gaging station.

Drainage area.—30 square miles.

Gage.—Vertical staff on left bank.

Channel.—Rough; bed of stream is rock; banks high and sparsely covered with willow bushes; one channel at all stages.

Diversions and storage.—No diversions between dam and station. Available capacity of reservoir at the present elevation of the spillway is reported by the company to be 13,000 acre-feet.

Accuracy.—Daily discharge for 1911 represents the mean of two current-meter measurements each day. Estimates of run-off for 1910 and 1911 probably reasonably accurate.

Cooperation.—Records and estimates are based on data furnished by Swendsen, Swendsen & Pierce, engineers for the Weiser Valley Land & Water Co. Data for 1911 were collected by Lynn Crandall, junior engineer United States Geological Survey, on furlough and employed by the above firm.

Discharge measurements of Lost Creek near Tamarack, Idaho, in the period Mar. 19 to June 23, 1911.

[Lynn Crandall, hydrographer.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Mar. 19	....	9.85	Apr. 15	1.89	51.8	May 12	2.52	149.6
20	....	9.73	16	1.91	53.6	12	2.51	149.7
21	1.44	13.7	16	1.92	55.4	13	2.52	151.1
21	1.50	17.7	17	2.00	64.1	13	2.52	155.6
22	1.67	26.7	17	2.02	68.0	14	2.51	150.3
22	1.62	24.7	18	2.07	72.0	14	2.51	152.4
23	1.78	36.4	18	2.10	75.1	15	2.50	148.4
23	1.83	41.2	19	2.11	76.8	15	2.50	145.6
24	1.90	45.3	19	2.12	79.0	16	2.50	150.2
24	1.92	54.8	20	2.13	82.7	16	2.50	149.8
25	1.91	49.4	20	2.12	77.1	17	2.51	147.3
25	1.91	51.4	21	2.15	83.4	17	2.51	148.7
26	1.82	40.2	21	2.14	80.5	18	2.52	151.1
26	1.82	40.5	22	2.22	89.3	18	2.52	151.3
27	1.78	38.2	22	2.15	85.9	19	2.52	152.0
27	1.79	39.6	23	2.30	105.5	19	2.53	153.0
28	1.72	35.1	23	2.24	94.0	20	2.51	151
28	1.72	33.9	24	2.33	110.3	20	2.51	148
29	1.71	37.3	24	2.32	108.3	21	2.50	147
29	1.69	32.7	25	2.38	120.6	21	2.50	142.4
30	1.86	45.8	25	2.36	114.8	22	2.49	140
30	1.79	40.2	26	2.42	124.8	22	2.50	147.3
31	1.99	60.3	26	2.40	122.9	23	2.48	143
31	1.94	55.5	27	2.46	135	23	2.48	142.6
Apr. 1	2.08	71.2	27	2.45	132.4	24	2.47	144
1	2.18	87.2	28	2.46	134.7	24	2.47	141.5
2	2.23	95.9	28	2.48	139	25	2.47	140
2	2.22	91.6	29	2.48	140.2	25	2.47	140
3	2.25	99.9	29	2.46	134.8	26	2.45	137
3	2.28	104.8	30	2.48	139.9	26	2.47	139
4	2.28	106.9	30	2.48	141.8	27	2.44	137
4	2.28	105.7	May 1	2.48	141.2	27	2.44	135
5	2.23	97.9	1	2.48	140.8	28	2.44	136.2
5	2.25	98.4	2	2.48	140	28	2.44	135
6	2.18	88.7	2	2.49	141.8	29	2.43	130.5
6	2.21	95.1	3	2.50	144.4	29	2.44	138
7	2.09	76.4	3	2.50	144.6	30	2.43	133
7	2.11	77.6	4	2.51	147.1	30	2.43	136
8	2.07	75.5	4	2.51	143.5	31	2.41	135.6
8	2.06	73.0	5	2.53	154.0	31	2.42	138
9	2.11	83.2	5	2.52	148.8	June 1	2.41	132.4
9	2.14	87.2	6	2.54	155.6	1	2.41	132
10	2.15	87.6	6	2.53	151.5	2	2.40	130
10	2.15	89.4	7	2.54	151.8	2	2.41	131
11	2.15	88.8	7	2.55	156.0	3	2.40	128
11	2.13	84.1	8	2.55	155.5	3	2.41	134
12	2.12	80.4	8	2.55	157.4	4	2.40	132.5
12	2.10	80.1	9	2.55	158.2	4	2.41	135
13	2.05	68.6	9	2.55	158.0	5	2.41	135
13	2.04	69.4	10	2.54	154.2	5	2.40	133
14	1.96	64.4	10	2.55	158.4	6	2.40	130.4
14	1.96	59.2	11	2.53	152.0	6	2.40	130
15	1.90	53.6	11	2.53	153.8	7	2.40	130

Discharge measurements of Lost Creek near Tamarack, Idaho, in the period Mar. 19 to June 23, 1911—Continued.

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
June 7	2.41	132	June 13	2.40	131	June 18	2.37	124
8	2.41	132.3	13	2.40	128	19	2.35	124.2
8	2.41	132.4	14	2.39	129	19	2.35	124
9	2.41	131	14	2.39	128.5	20	2.34	122
9	2.41	132	15	2.39	128	20	2.34	122
10	2.41	134	15	2.39	128	21	2.33	118
10	2.41	131	16	2.39	129	21	2.33	119
11	2.40	133.3	16	2.39	130.2	22	2.33	119
11	2.40	133	17	2.38	128	22	2.32	115
12	2.40	134	17	2.38	129	23	2.31	111
12	2.40	130	18	2.37	126	23	2.31	108.8

Daily gage height, in feet, and discharge, in second-feet, of Lost Creek near Tamarack, Idaho, for Mar. 19 to June 23, 1911.

[Lynn Crandall, observer.]

Day.	March.		April.		May.		June.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1			2.13	79.2	2.48	141	2.41	132
2			2.22	93.8	2.48	141	2.40	130
3			2.26	102	2.50	144	2.40	131
4			2.28	106	2.51	145	2.40	133
5			2.24	98.2	2.52	152	2.40	134
6			2.20	91.9	2.54	154	2.40	130
7			2.10	77	2.54	154	2.40	131
8			2.06	74.2	2.55	156	2.41	132
9			2.12	85.2	2.55	158	2.41	131
10			2.15	88.5	2.54	156	2.41	133
11			2.15	86.4	2.53	153	2.40	133
12			2.11	80.2	2.52	150	2.40	132
13			2.06	69.0	2.52	153	2.40	130
14			1.96	61.8	2.51	151	2.39	129
15			1.90	52.7	2.50	147	2.39	128
16			1.92	54.5	2.50	150	2.39	130
17			2.01	66.0	2.51	148	2.38	128
18			2.08	73.6	2.52	151	2.37	125
19		9.8	2.12	77.9	2.52	152	2.35	124
20		9.7	2.12	79.9	2.51	150	2.34	122
21	1.46	15.7	2.14	82.0	2.50	145	2.33	118
22	1.64	25.7	2.18	87.6	2.50	144	2.32	116
23	1.80	38.8	2.27	99.8	2.48	143	2.31	110
24	1.92	50.1	2.32	109	2.47	143		
25	1.91	50.4	2.37	118	2.47	140		
26	1.82	40.4	2.41	124	2.46	138		
27	1.78	38.9	2.46	134	2.44	135		
28	1.72	34.5	2.47	137	2.44	135		
29	1.70	35.0	2.47	138	2.44	134		
30	1.42	43.0	2.48	141	2.43	134		
31	1.96	57.8			2.41	137		

NOTE.—Values given for Mar. 19 and 20 are the discharges measured on those days. All other values are the means of two discharge measurements. Gates closed June 24 to July 31. No records obtained Aug. 1 to Dec. 31, although the reservoir gates were opened in varying amounts during this period.

Monthly discharge of Lost Creek near Tamarack, Idaho, for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January			[a] 8	492	D.
February			[a] 8	444	D.
March	57.8		[b] 19.7	1,210	B.
April	141	52.7	92.3	5,490	A.
May	158	134	146	8,980	A.
June	134	0	98.1	5,840	A.
The period				22,500	

[a] Estimated. [b] Mean daily discharge Mar. 1-18 estimated at 9 second-feet.

Summary of measurements showing total inflow into Lost Valley reservoir, Idaho.

Date.	Inflow.	Date.	Inflow.	Date.	Inflow.
1910.[a]	*Sec.-ft.*	1911.	*Sec.-ft.*	1911.	*Sec.-ft.*
July 22	8.3	June 25	37	July 5	26
31	9.1	26	40	6	23
Aug. 9	9.1	27	42	7	22
17	9.1	28	40	8	21
22	6.6	29	37	9	20
27	6.6	30	37	10	20
Sept. 9	6.6	July 1	35	11	20
		2	34	12	18
1911.[b]		3	31	13	17
June 24	40	4	29	14	17

[a] Measurements by A. V. Tallman, deputy of Idaho State engineer.
[b] Measurements made by Lynn Crandall.

Run-off of Lost Creek at Lost Valley reservoir near Tamarack, Idaho, for 1910-11.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
1910.				
January			8.0	492
February			8.0	444
March	196	9	44.7	2,750
April	236	163	206	12,300
May	218	30	102	6,270
June			30	1,790
July			14.8	910
August			8.17	502
September			7.0	417
October			9.0	553
November			9.0	536
December			9.0	553
The year			20.2	40,000
1911.				
January			8.0	492
February			8.0	444
March	57.8		19.7	1,210
April	141	52.7	92.3	5,490
May	158	134	146	8,980
June	134	37	107	6,370
July	35		17.9	1,100
August			8.0	492
September			7.0	417
October			8.0	492
November			9.0	536
December			9.0	553
The year			19.0	37,600

NOTE.—Records for Jan. 1 to June 30, 1910, and Jan. 1 to June 23, 1911, show amount of water passing the gaging station below the dam. Records for July 1 to Dec. 31 each year represent the inflow into the reservoir determined from monthly estimates based on measurements of inflow and knowledge of local conditions. On May 22, 1910, the gates were partly and on July 1, 1910, entirely closed. In 1911 the gates were closed June 24. The water stored—estimated by Swendsen, Swendsen & Pierce as 12,500 acre-feet for 1910 and 11,000 acre-feet for 1911—was released between July 1 and Dec. 31 each year, and passed the gaging station in addition to the amounts shown in above tables for July to December. The tabulated yearly values include the amounts stored and released.

MIDDLE FORK OF WEISER RIVER NEAR MIDDLE FORK, IDAHO.

Location.—In sec. 10, T. 15 N., R. 1 W. Boise meridian, at Shaw's ranch, about three-fourths of a mile upstream from Middle Fork post office and about 3 miles above the junction of the Middle Fork with the main Weiser River; below all principal tributaries.

Records available.—October 4, 1910, to September 30, 1911.

Drainage area.—About 84 square miles.

Gage.—Inclined staff on right bank near Mr. Shaw's house.

Channel.—Gravel; shifts at times.

Discharge measurements.—By wading or from a suspension footbridge at the gage.

Winter flow.—Somewhat affected by ice.

Diversions.—The Council Mesa Orchard ditch diverts about 6 miles above the station.

Accuracy.—Rating curves fairly well defined; records reliable.

Discharge measurements of Middle Fork of Weiser River near Middle Fork, Idaho, for the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911		*Feet.*	*Sec.-ft.*
Nov. 6	Lynn Crandall	2.46	21.2	Mar. 17	Crandall and Davis	3.08	118
Dec. 28[a]	.....do	2.92	39.7	Apr. 20	A. B. Purton	3.10	113
28[b]	.....do	2.67	40.6	May 14	J. C. Dort	3.85	313
				June 1	.....do	4.18	467
1911.				24	O. W. Hartwell	3.82	354
Jan. 28[c]	Lynn Crandall	3.59	39.5	July 22	.....do	2.62	65.3
Feb. 13	.....do	2.68	48.0	Sept. 12	Lynn Crandall	2.19	13.4

[a] Mush ice at control. [b] No ice at control. [c] Ice at gage and control.

Daily gage height, in feet, of Middle Fork of Weiser River near Middle Fork, Idaho, for the year ending Sept. 30, 1911.

[Amos Shaw, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	2.4	2.9	2.9	3.2	3.0	3.1	3.7	4.6	3.5	2.5	2.2
2	......	2.4	2.9	3.2	3.1	2.8	3.5	3.7	4.4	3.3	2.4	2.2
3	......	2.5	3.2	2.7	3.0	2.9	3.4	4.0	4.2	3.3	2.4	2.2
4	2.6	2.4	3.2	2.7	3.0	2.7	3.4	4.2	4.4	3.2	2.4	2.2
5	2.5	2.4	3.0	2.8	2.9	2.7	3.3	4.2	4.3	3.2	2.4	2.2
6	2.5	2.5	2.9	3.4	2.8	2.7	3.2	4.2	4.2	3.1	2.4	2.3
7	2.4	2.5	2.9	3.2	2.9	3.1	3.2	4.0	5.1	3.1	2.4	2.3
8	2.4	3.3	2.9	2.6	3.0	3.0	3.2	4.0	4.8	3.1	2.4	2.3
9	2.4	2.6	2.8	2.6	3.0	3.0	3.2	3.9	4.7	3.0	2.4	2.3
10	2.4	2.8	2.8	2.5	3.0	3.0	3.2	3.8	4.7	2.9	2.4	2.3
11	2.4	2.9	2.8	2.6	3.0	2.9	3.2	3.8	4.7	2.9	2.4	2.3
12	2.5	3.0	2.8	2.6	2.7	3.0	3.1	3.9	4.4	2.9	2.4	2.3
13	2.4	2.7	2.7	2.6	2.7	3.0	3.2	4.0	4.5	2.9	2.4	2.3
14	2.4	2.6	2.7	2.6	2.7	3.0	3.1	3.8	4.7	2.9	2.3	2.3
15	2.4	2.5	2.7	2.6	2.7	3.1	3.2	4.4	4.7	2.8	2.2	2.3
16	2.4	2.5	2.7	2.5	3.0	3.0	3.1	4.5	4.5	2.8	2.2	2.3
17	2.5	2.5	2.7	2.6	2.9	3.1	3.1	4.3	4.5	2.8	2.2	2.3
18	2.45	2.5	2.7	2.6	2.9	3.0	3.2	4.4	4.3	2.7	2.2	2.3
19	2.4	2.5	2.6	2.6	2.7	3.2	3.2	4.2	4.2	2.7	2.2	2.3
20	2.4	2.5	2.6	2.6	2.7	3.2	3.1	4.2	5.0	2.7	2.2	2.3
21	2.4	3.1	2.6	2.6	2.7	3.3	3.1	3.9	3.9	2.7	2.2	2.3
22	2.45	3.2	2.6	3.0	2.8	3.2	3.1	4.1	3.7	2.6	2.2	2.2
23	2.4	3.2	2.6	3.3	2.8	3.5	3.2	4.1	3.6	2.6	2.2	2.3
24	2.4	2.9	2.6	3.5	2.8	3.6	3.2	4.1	3.6	2.5	2.2	2.3
25	2.4	2.8	2.6	3.8	2.8	3.4	3.5	4.1	3.9	2.5	2.2	2.3
26	2.4	2.8	2.6	3.8	2.8	3.2	3.7	4.1	3.7	2.5	2.2	2.3
27	2.4	3.2	2.6	3.7	2.8	3.1	3.7	4.1	3.8	2.5	2.2	2.3
28	2.4	3.0	2.6	3.5	2.9	3.1	3.8	3.9	3.6	2.5	2.2	2.3
29	2.4	2.9	2.6	3.3	......	3.1	3.7	3.9	3.6	2.5	2.2	2.3
30	2.4	2.9	2.6	3.5	......	3.2	3.5	4.2	3.5	2.5	2.2	2.3
31	2.4	......	2.7	3.9	......	3.1	......	4.2	......	2.5	2.2	......

NOTE.—Gage heights affected by ice Dec. 31, Jan. 1 to 7 and 22 to 30.

Daily discharge, in second-feet, of Middle Fork of Weiser River near Middle Fork, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	17	66	......	112	94	117	263	646	240	49	14
2	......	17	66	......	95	68	205	263	565	186	39	14
3	......	24	112	......	81	83	180	365	486	186	39	14
4	33	17	112	......	82	55	180	440	565	162	39	14
5	24	17	80	......	68	56	157	440	525	162	39	14
6	24	24	66	......	56	57	136	440	486	140	39	20
7	17	24	66	......	69	115	136	365	859	140	39	20
8	17	130	66	33	83	100	136	365	730	140	39	20
9	17	33	54	33	84	100	136	329	688	120	39	20
10	17	54	54	24	85	100	136	295	688	102	39	20
11	17	66	54	33	85	85	136	295	688	102	39	20
12	24	80	54	33	49	100	117	329	565	102	39	20
13	17	43	43	33	49	100	136	365	605	102	39	20
14	17	33	43	33	50	100	117	295	688	102	30	20
15	17	24	43	33	50	117	136	520	688	86	22	20
16	17	24	43	24	87	100	117	560	605	86	22	20
17	24	24	43	33	75	117	117	489	605	86	22	20
18	20	24	43	33	76	100	136	529	525	72	22	20
19	17	24	33	33	52	136	136	455	486	72	21	20
20	17	24	33	33	52	136	117	458	816	72	21	20
21	17	95	33	33	53	157	117	350	372	72	20	20
22	20	112	33	......	65	136	117	426	302	60	20	14
23	17	112	33	......	65	205	136	429	270	60	19	20
24	17	66	33	......	66	233	136	432	270	49	19	20
25	17	54	33	......	66	180	205	434	372	49	18	20
26	17	54	33	......	67	136	263	436	302	49	18	20
27	17	112	33	......	67	117	263	438	336	49	17	20
28	17	80	33	......	82	117	295	365	270	49	17	20
29	17	66	33	......	......	117	263	367	270	49	16	20
30	17	66	33	......	......	136	205	480	240	49	15	20
31	17	......	35	286	......	117	......	483	......	49	15	......

NOTE.—Discharge determined as follows: Oct. 4 to Feb. 2 from a fairly well defined curve; mean discharge estimated at 35 second-feet for Dec. 31 and Jan. 1 to 7; at 40 second-feet for Jan. 22 to 30; shifting-channel methods used Feb. 3 to Mar. 7, May 15 to 31, and Aug. 19 to 31; Mar. 8 to May 14 and Sept. 1 to 30 from a fairly well defined curve; June 1 to Aug. 18 from a well defined curve.

Monthly discharge of Middle Fork of Weiser River near Middle Fork, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October 4-31	33	17	18.6	1,030	B.
November	130	17	51.3	3,050	B.
December	112	33	49.6	3,050	B.
January	286	24	43.1	2,650	C.
February	112	49	70.4	3,910	B.
March	233	55	115	7,070	B.
April	295	117	159	9,460	B.
May	560	263	403	24,800	B.
June	859	240	517	30,800	A.
July	240	49	98.2	6,040	A.
August	49	15	28.1	1,730	B.
September	20	14	18.8	1,120	B.
The period	......	......	......	94,710	

CRANE CREEK NEAR MIDVALE, IDAHO.

Location.—In sec. 19, T. 12 N., R. 2 W. Boise meridian, about 300 feet below the dam of the Crane Creek Irrigation Co.; about 12 miles southeast of Midvale. No tributaries between dam and station; Last Chance Creek enters a short distance below.

Records available.—October 30, 1910, to September 30, 1911.

Drainage area.—269 square miles.

Gage.—Vertical staff gage in three sections, also an inclined section.

Channel.—Rough and permanent. Conditions were changed, however, during winter of 1911 and 1912 by some work at the dam.

Discharge measurements.—Made by wading, or from a cable at high stages.

Winter flow.—Affected by ice.

Diversions.—No diversions between the dam and the station.

Accuracy.—Rating curve well defined; records reliable for periods covered by gage heights.

Cooperation.—The Crane Creek Irrigation Co. has furnished the gage-height record and some of the discharge measurements.

Discharge measurements of Crane Creek near Midvale, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 30	Lynn Crandall	1.26	[a]1.0	Feb. 1	Lynn Crandall	6.0	[c]1,570
Dec. 25	do	2.13	28	12	do	2.76	88.2
				13[a]	Z. N. Vaughn	2.60	[d]75.0
1911.				June 22	O. W. Hartwell	2.52	69.4
Jan. 27	Crandall and Vaughn	2.60	59.6	26	do	1.64	7.5
27[a]	do	2.59	70.2	July 10	do	1.50	2.7
31	Lynn Crandall	8.0	[b]3,330	10	do	1.50	2.8

[a] Made with Lallie current meter.
[b] Surface velocity measurement. Coefficient, 0.90.
[c] Surface velocity measurement. Coefficient, 0.89.
[d] Surface velocity measurement. Coefficient, 0.80.

Daily gage height, in feet, of Crane Creek near Midvale, Idaho, for the year ending Sept. 30, 1911.

[Gilbert Thornton, observer.]

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.
1	1.7	4.6	1.8	5.85		2.0	2.0	2.0	
2	1.2	3.9	2.0	6.1		2.0	2.0	2.1	
3	2.0	8.9	1.9	4.3		2.0	2.0	2.0	
4	1.8	7.2	1.9	4.1		2.0	2.0	1.9	
5	1.4	4.9	1.8	3.8	1.8	2.0	2.0	2.0	
6	2.0	4.4	1.9	3.9	2.9	2.0	3.1	2.5	
7	2.0	4.5	2.0	3.4	5.3	2.0	2.7	3.4	
8	2.1	3.6	2.1	2.9	5.1	2.0	2.5	4.7	
9	2.0	4.0	2.2	2.8	5.0	2.0	2.0	3.0	
10	3.1	3.8	1.7	3.0	4.5	2.0	2.0	2.5	
11	4.0	4.6	1.8	2.9	5.0	2.0	2.0	2.0	1.4
12	4.5	4.0	1.9	2.9	4.5	2.0	3.4	2.0	
13	3.2	3.7	1.8	2.6	4.2	2.0	2.0	2.0	
14	2.0	3.4	1.9	2.5	3.8	2.0	2.0	2.0	1.0
15	4.0	3.2	2.0	2.6	4.0	2.0	5.0	2.0	
16	2.1	3.0	2.0	2.4	4.6	2.0	5.2	2.0	
17	1.8	2.8	1.8	2.8	3.9	2.0	6.4	2.0	
18	1.4	2.5	1.7	2.6	3.6	2.0	5.9	2.0	1.9
19	2.0	2.5	2.1	2.4	3.8	2.0	4.0	2.0	
20	2.3	2.4	2.4	2.2	4.2	2.0	3.3	2.0	
21	5.4	2.2	2.5	2.0	4.0	2.0	2.0	3.4	1.2
22	4.2	1.7	2.0	2.0	3.9	2.0	2.0	2.5	
23	5.3		1.9	2.0	3.7	2.0	2.0	2.0	
24	3.4		1.8	2.0	3.4	2.0	2.0	2.0	
25	2.6	2.1	2.0	2.0	3.7	2.0	2.0	2.0	1.0
26	2.2	2.0	3.6		3.6	2.0	2.0	2.0	
27	2.0	1.8	2.6		8.2	2.0	2.0	8.0	
28	2.6	2.1	2.8		2.8	2.0	2.0	4.8	1.0
29	5.7	2.0	3.4		2.7	2.0	2.0	4.3	
30	4.9	1.9	5.0		2.6	2.0	2.0	2.8	
31		2.3	8.0		2.5		2.0		

NOTE.—Gage heights affected by ice Jan. 1 to 25 and Feb. 7 to 25. Ice effect during December probably slight. Shore ice existed at the station Jan. 26 to 28. Channel dry during August and September.

Daily discharge, in second-feet, of Crane Creek near Midvale, Idaho, for the year ending Sept. 30, 1911.

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.
1	10	706	....	1,450	13	22	22	22	30
2	1	411	....	1,640	13	22	22	26	21
3	22	4,240	....	573	13	22	22	22	19
4	13	2,560	....	490	13	22	22	17	16
5	2	856	....	374	13	22	22	22	14
6	22	616	....	411	130	22	171	63	12
7	22	660	....	....	1,080	22	93	246	9
8	26	306	....	....	966	22	63	754	7
9	22	450	....	....	910	22	22	150	5
10	171	374	....	....	660	22	22	63	3
11	450	706	....	....	910	22	22	22	2
12	660	450	....	....	660	22	246	22	1
13	194	339	....	....	531	22	22	22	1
14	22	246	....	....	374	22	22	22	0
15	450	194	....	....	450	22	910	22	1
16	26	150	....	....	706	22	1,020	22	2
17	13	111	....	....	411	22	1,870	22	5
18	2	63	....	....	306	22	1,490	22	17
19	22	63	....	....	374	22	450	22	5
20	41	51	....	....	531	22	219	22	2
21	1,150	33	....	....	450	22	22	246	1
22	531	10	....	....	411	22	22	63	0
23	1,080	15	....	....	339	22	22	22	0
24	246	20	....	....	246	22	22	22	0
25	77	26	....	....	339	22	22	22	0
26	33	22	266	13	306	22	22	22	0
27	22	13	61	13	194	22	22	150	0
28	77	26	90	13	111	22	22	804	0
29	1,340	22	246	....	93	22	22	573	0
30	856	17	910	....	77	22	22	111	0
31	....	41	3,330	....	63	....	22	....	0

NOTE.—Discharge determined from a fairly well-defined curve. Mean discharge estimated for Jan. 1 to 25 at 20 second-feet; Feb. 7 to 25 at 67 second-feet; Feb. 26 to Mar. 4 estimated as given. Discharges estimated for days from July 1 to 21, for which gage heights are missing. No flow July 22 to Sept. 30.

Monthly discharge of Crane Creek near Midvale, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
November	1,340	1	253	15,100	B.
December	4,240	10	445	27,400	B.
January	3,330	....	174	10,700	C.
February	1,640	13	223	12,400	C.
March	1,080	13	377	23,200	A.
April	22	22	22.0	1,310	B.
May	1,870	22	226	13,900	A.
June	804	17	121	7,200	A.
July	30	0	5.6	344	C.
August	0	0	0	0	
September	0	0	0	0	
The period	....	....	....	112,000	

MANN CREEK NEAR WEISER, IDAHO.

Location.—In sec. 11, T. 12 N., R. 5 W. Boise meridian, at S. W. Spangler's ranch, about one-fourth mile above the dam site, about 12 miles above the junction of Mann Creek with Weiser River, and about 13 miles from Weiser post office. No tributaries between station and dam site.

Records available.—March 9, 1911, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Inclined gage on right bank.

Channel.—Gravel; shifts at high stages.

Discharge measurements.—Made by wading or from a footbridge about 15 feet below the gage.

Diversions.—Joslin ditch diverts water around the station; carries water usually only during flood season. Maximum capacity, 8 or 9 second-feet. Estimated that about 150 acre-feet were diverted during the season of 1911.

Accuracy.—Rating curves well defined for 1911; records reliable.

Cooperation.—Gage heights furnished by Mann Creek Water Users' Association.

Discharge measurements of Mann Creek near Weiser, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 9	A. B. Purton	2.68	43.7	May 30	Dort and Cooley	2.83	56.4
Apr. 22	do	2.95	75.0	July 9	O. W. Hartwell	2.02	7.7
May 6	J. C. Dort	3.30	110	Sept. 13	Crandall and Cooley	1.70	.5

Daily gage height, in feet, of Mann Creek near Weiser, Idaho, for the year ending Sept. 30, 1911.

[S. W. Spangler, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1		3.85	3.4	2.8	2.1	1.65	1.6
2		3.75	3.45	2.9	2.1	1.6	1.6
3		3.55	3.45	2.8	2.1	1.6	1.6
4		3.4	3.4	2.8	2.0	1.6	1.6
5		3.3	3.45	2.8	2.0	1.6	1.6
6		3.4	3.5	2.9	2.0	1.75	1.7
7		3.35	3.25	3.0	1.9	1.75	1.7
8		3.25	3.3	3.1	1.9	1.7	1.7
9	2.75	3.35	3.15	2.9	1.95	1.7	1.7
10	2.75	3.3	3.1	2.85	2.0	1.7	1.7
11	2.8	3.3	3.1	2.8	1.9	1.6	1.7
12	2.8	3.25	3.1	2.7	1.9	1.6	1.7
13	2.9	3.05	3.1	2.6	1.95	1.6	1.7
14	3.0	3.1	3.1	2.55	1.9	1.6	1.7
15	3.15	3.05	3.2	2.45	1.9	1.6	1.7
16	3.2	3.05	3.45	2.4	1.95	1.6	1.7
17	3.35	3.15	3.45	2.4	1.9	1.6	1.7
18	3.45	3.2	3.45	2.4	1.9	1.6	1.8
19	3.4	3.3	3.3	2.3	1.9	1.6	1.8
20	3.6	3.25	3.15	2.3	1.9	1.6	1.8
21	3.65	3.25	3.1	2.3	1.9	1.6	1.8
22	3.7	3.1	3.2	2.3	1.9	1.6	1.8
23	3.8	3.1	3.1	2.25	1.9	1.6	1.8
24	3.7	3.3	3.1	2.2	1.9	1.6	1.8
25	3.45	3.55	3.2	2.2	1.9	1.6	1.8
26	3.25	3.55	3.0	2.2	1.9	1.6	1.8
27	3.15	3.55	3.0	2.15	1.9	1.6	1.8
28	3.15	3.4	2.95	2.1	1.9	1.6	1.85
29	3.25	3.35	2.9	2.2	1.78	1.6	1.85
30	3.6	3.35	2.88	2.2	1.7	1.6	1.85
31	3.8		2.88		1.7	1.6	

Daily discharge, in second-feet, of Mann Creek near Weiser, Idaho, for the year ending Sept. 30, 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	196	127	55	10	0.8	0.1
2	....	180	134	65	10	.4	.1
3	....	148	134	55	10	.4	.1
4	....	127	127	55	6.6	.4	.1
5	....	113	134	55	6.6	.4	.1
6	....	127	141	65	6.6	1.8	.6
7	....	120	106	76	4.2	1.8	.6
8	....	106	113	88	4.2	1.2	.6
9	50	120	94	65	5.4	1.2	.6
10	50	113	88	60	6.6	1.2	.6
11	55	113	88	55	4.2	.4	.6
12	55	106	88	46	4.2	.4	.6
13	65	82	88	38	5.4	.4	.6
14	76	88	88	34	4.2	.4	.6
15	94	82	100	27	4.2	.4	.6
16	100	82	134	24	5.4	.4	.6
17	120	94	134	24	4.2	.3	.6
18	134	100	134	24	4.2	.3	1.2
19	127	113	113	19	4.2	.3	1.2
20	156	106	94	19	4.2	.3	1.2
21	164	106	88	19	4.2	.2	1.2
22	172	88	100	19	4.2	.2	1.2
23	188	88	88	16	4.2	.2	1.2
24	172	113	88	14	4.2	.2	1.2
25	134	148	100	14	4.2	.1	1.2
26	106	148	76	14	4.2	.1	1.2
27	94	148	76	12	4.2	.1	1.2
28	94	127	70	10	4.2	.1	2.0
29	106	120	65	14	2.2	.1	2.0
30	156	120	63	14	1.2	.1	2.0
31	188	....	63	....	1.2	.1	....

NOTE.—Discharge Mar. 9 to Aug. 15 determined from a rating curve well defined between 4 and 140 second-feet; shifting channel methods used Aug. 16 to 25; discharge Aug. 26 to Sept. 30 from a curve well defined between 3 and 141 second-feet.

Monthly discharge of Mann Creek near Weiser, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
March 9-31	188	50	115	5,250	A.
April	196	82	117	6,960	A.
May	141	63	101	6,210	A.
June	88	10	36.5	2,170	A.
July	10	1.2	4.93	303	A.
August	1.8	.1	.47	29	B.
September	2.0	.1	.86	51	B.
The period	....	....	....	21,000	

POWDER RIVER AT SALISBURY, OREG.

Location.—In sec. 36, T. 10 S., R. 39 E., at a wagon bridge one-fourth mile below the railroad station at Salisbury.

Records available.—December 20, 1903, to September 30, 1911.

Drainage area.—230 square miles.

Gage.—Vertical staff on right bank 15 feet above bridge.

Channel.—Gravel; practically permanent.

Discharge measurements.—Made from wagon bridge, or by wading near gage.

Winter flow.—Seriously affected by ice; flow estimated from discharge measurements, observer's notes, and weather records.

Artificial control.—No storage developed above the station; most of the summer low-water flow diverted for irrigation in Sumpter Valley.

Accuracy.—Only fair on account of unfavorable conditions.

The following discharge measurement was made by R. W. Davenport:

July 21, 1911: Gage height, 1.50 feet; discharge, 15.3 second-feet.

Daily gage height, in feet, of Powder River at Salisbury, Oreg., for the year ending Sept. 30, 1911.

[R. M. Garrett, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.35	1.85	2.05	1.65	1.65	1.65	3.15	3.05	3.05	2.40	1.40	1.15
2	1.35	1.85	2.1	1.70	1.75	1.70	3.20	3.15	3.05	2.45	1.45	1.10
3	1.45	1.85	2.1	1.75	1.75	1.70	3.35	3.15	3.15	2.35	1.45	1.05
4	1.45	1.75	1.9	1.65	1.70	1.70	3.40	3.25	3.10	2.30	1.35	1.05
5	1.4	1.75	1.95	1.65	1.65	1.85	3.30	3.25	3.05	2.25	1.40	1.00
6	1.45	1.8	1.85	1.60	1.70	1.85	3.25	3.30	2.95	2.25	1.35	1.00
7	1.5	1.8	1.85	1.65	1.65	1.75	3.15	3.20	2.90	2.20	1.30	1.00
8	1.5	1.85	1.85	1.65	1.65	1.75	3.05	3.10	3.05	2.10	1.30	1.05
9	1.4	1.9	1.8	1.65	1.60	1.85	2.90	2.95	3.10	2.05	1.35	1.05
10	1.4	1.9	1.8	1.65	1.60	1.85	2.85	2.85	3.15	2.05	1.35	1.00
11	1.45	1.85	1.8	1.70	1.60	1.95	2.70	2.75	3.20	1.95	1.40	1.00
12	1.45	1.8	1.75	1.65	1.60	1.95	2.65	2.55	3.15	1.85	1.30	1.00
13	1.35	1.85	1.8	1.65	1.60	2.00	2.75	....	3.25	1.75	1.25	1.05
14	1.35	1.9	1.8	1.65	1.60	2.00	2.80	2.70	3.35	1.75	1.20	1.05
15	1.4	1.95	1.9	1.60	1.60	2.05	2.85	2.75	3.35	1.65	1.25	1.00
16	1.35	1.9	1.85	1.65	1.60	2.10	3.00	2.80	3.45	1.55	1.30	1.10
17	1.45	1.75	1.85	1.75	1.55	2.15	3.05	2.90	3.35	1.50	1.25	1.10
18	1.45	1.75	1.9	1.75	1.55	2.20	3.00	2.90	3.30	1.45	1.20	1.30
19	1.4	1.8	1.75	1.75	1.55	2.25	2.95	2.90	3.35	1.40	1.20	1.15
20	1.5	1.85	1.85	1.65	1.55	2.30	2.90	2.90	3.25	1.50	1.20	1.10
21	1.45	1.8	1.75	1.65	1.60	2.35	2.90	2.95	3.25	1.55	1.30	1.05
22	1.45	1.9	1.75	1.75	1.60	2.45	3.00	2.95	3.30	1.55	1.30	1.20
23	1.45	1.95	1.85	1.75	1.60	2.50	3.05	2.75	3.25	1.45	1.30	1.20
24	1.5	1.95	1.8	1.75	1.60	3.00	3.10	2.85	3.15	1.45	1.25	1.20
25	1.5	1.9	1.7	1.80	1.60	3.25	3.05	2.75	3.15	1.45	1.20	1.30
26	1.55	1.95	1.7	1.85	1.60	3.10	3.00	2.80	3.05	1.40	1.15	1.20
27	1.65	1.95	1.7	1.85	1.60	3.05	3.05	2.90	3.05	1.40	1.10	1.15
28	1.65	1.9	1.65	1.85	1.60	2.85	3.15	2.95	2.95	1.45	1.10	1.15
29	1.75	1.85	1.65	1.75	....	2.85	3.05	3.00	2.90	1.40	1.10	1.10
30	1.75	1.85	1.65	1.65	....	2.75	3.10	3.00	2.75	1.40	1.10	1.10
31	1.85	....	1.65	1.65	....	3.00	....	3.05	....	1.45	1.10	....

NOTE.—River frozen Jan. 1 to Mar. 18, 1911. Gage read to bottom of ice.

Daily discharge, in second-feet, of Powder River at Salisbury, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	9	51	79	30	30	30	352	320	320	143	11	3
2	9	51	87	34	40	34	368	352	320	154	14	2
3	14	51	87	40	40	34	419	352	352	133	14	2
4	14	40	57	30	34	34	436	385	336	123	9	2
5	11	40	64	30	30	51	402	385	320	114	11	1
6	14	45	51	25	34	51	385	402	288	114	9	1
7	17	45	51	30	30	40	352	368	272	105	7	1
8	17	51	51	30	30	40	320	336	320	87	7	2
9	11	57	45	30	25	51	272	288	336	79	9	2
10	11	57	45	30	25	51	257	257	352	79	9	1
11	14	51	45	34	25	64	214	228	368	64	11	1
12	14	45	40	30	25	64	201	176	352	51	7	1
13	9	51	45	30	25	71	228	195	385	40	6	2
14	9	57	45	30	25	71	242	214	419	40	4	2
15	11	64	57	25	25	79	257	228	419	30	6	1
16	9	57	51	30	25	87	304	242	454	21	7	2
17	14	40	51	40	21	96	320	272	419	17	6	2
18	14	40	57	40	21	105	304	272	402	14	4	7
19	11	45	40	40	21	114	288	272	419	11	4	3
20	17	51	51	30	21	123	272	272	385	17	4	2
21	14	45	40	30	25	133	272	288	385	21	7	2
22	14	57	40	40	25	154	304	288	402	21	7	4
23	14	64	51	40	25	165	320	228	385	14	7	4
24	17	64	45	40	25	304	336	257	352	14	6	4
25	17	57	34	45	25	385	320	228	352	14	4	7
26	21	64	34	51	25	336	304	242	320	11	3	4
27	30	64	34	51	25	320	320	272	320	11	2	3
28	30	57	30	51	25	257	352	288	288	14	2	3
29	40	51	30	40	......	257	320	304	272	11	2	2
30	40	51	30	30	......	228	336	304	228	11	2	2
31	51	......	30	30	......	304	......	320	......	14	2	......

NOTE.—Discharge determined from a rather poorly defined rating curve. Open channel rating curve has been applied to gage heights as reported during the frozen season; results probably a little low.

Monthly discharge of Powder River at Salisbury, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	51	9	17.3	1,060	B.
November	64	40	52.1	3,100	B.
December	87	30	48.3	2,970	B.
January	51	25	35.0	2,150	B.
February	40	21	26.9	1,490	B.
March	385	30	133	8,180	B.
April	436	201	313	18,600	B.
May	402	176	285	17,500	B.
June	454	228	351	20,900	B.
July	154	11	51.4	3,160	B.
August	14	2	6.5	400	B.
September	7	1	2.5	149	B.
The year	454	1	110	79,700	

POWDER RIVER NEAR NORTH POWDER, OREG.

Location.—In the NW. ¼ sec. 26, T. 6 S., R. 40 E., at proposed dam site for Thief Valley reservoir, 7 miles east of North Powder and about 8 miles southeast of Telocasset.

Records available.—March 9, 1909, to September 30, 1911.

Drainage area.—826 square miles.

Gage.—Inclined and vertical staff.

Channel.—Bowlders and gravel; practically permanent.

Discharge measurements.—Made from cable and car at gage section.

Winter flow.—River freezes; gage heights may be affected two or three months.

Artificial control.—Temporary dam constructed each year about 1 mile above the station to subirrigate adjoining lands. May cause some fluctuation during the low-water periods.

Diversions.—Most of the low-water flow of Powder River and tributaries is diverted above this point for irrigation.

Accuracy.—Results good, except during the winter, when as a rule no estimates can be made.

Cooperation.—Gage readings furnished in part by the Powder Land & Irrigation Co.

No discharge measurements made during the year.

Daily gage height, in feet, of Powder River near North Powder, Oreg., for the year ending Sept. 30, 1911.

[M. B. Fisk, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.15	1.3	1.75	......	......	......	3.0	1.65	1.50	2.00	0.75	0.60
2	1.15	1.3	1.8	......	......	......	3.2	1.61	1.49	1.97	.70	.60
3	1.15	1.3	1.85	......	......	5.5	2.90	1.59	1.70	1.95	.73	.60
4	1.2	1.3	1.9	......	......	6.0	2.80	1.51	2.00	1.80	.75	.65
5	1.2	1.3	1.95	......	......	7.5	2.75	1.44	1.98	1.70	.78	.70
6	1.25	1.3	2.0	......	......	7.0	2.60	1.43	2.00	1.64	.80	.72
7	1.25	1.3	1.95	......	......	5.7	2.55	1.42	2.10	1.60	.80	.75
8	1.25	1.3	1.9	......	......	4.0	2.50	1.41	2.22	1.52	.80	.74
9	1.25	1.3	1.95	2.00	......	3.0	2.50	1.41	2.42	1.45	.75	.74
10	1.25	1.45	1.95	......	......	2.90	2.40	1.40	2.50	1.35	.75	.72
11	1.2	1.55	1.8	......	......	2.90	2.30	1.40	2.75	1.35	.72	.73
12	1.2	1.6	1.7	......	......	2.80	2.25	1.35	2.90	1.35	.72	.75
13	1.2	1.6	1.7	......	......	2.70	2.20	1.30	3.3	1.35	.72	.77
14	1.2	1.6	1.7	......	......	2.70	2.15	1.30	3.6	1.35	.70	.79
15	1.25	1.6	1.7	......	......	2.50	2.10	1.56	3.5	1.20	.70	.80
16	1.25	1.55	1.7	......	......	2.50	2.10	1.83	3.5	1.15	.70	.82
17	1.3	1.55	1.65	......	......	2.50	1.95	1.85	3.2	1.15	.70	.82
18	1.3	1.55	1.6	......	......	2.70	1.88	1.87	2.50	1.15	.70	.83
19	1.3	1.55	1.6	......	......	2.70	1.74	1.89	2.20	1.05	.70	.84
20	1.3	1.55	1.55	......	......	2.75	1.75	2.00	2.10	1.00	.70	.85
21	1.25	1.6	1.55	......	......	2.75	1.75	2.00	2.90	1.00	.70	.85
22	1.25	1.7	1.65	1.20	......	2.75	1.75	1.95	2.50	.95	.70	.86
23	1.25	1.75	1.65	......	......	3.0	1.75	1.90	2.60	.96	.70	.88
24	1.25	1.8	1.75	......	......	3.4	1.75	1.90	2.50	.95	.70	.89
25	1.25	1.75	1.75	......	......	3.8	1.72	1.85	2.20	.93	.70	.90
26	1.2	1.6	1.7	......	......	3.6	1.72	1.83	2.00	.90	.71	.90
27	1.25	1.65	1.6	......	......	3.5	1.71	1.85	2.00	.85	.71	.90
28	1.25	1.65	1.55	......	......	3.3	1.71	1.84	2.30	.85	.70	.92
29	1.3	1.65	1.6	......	......	3.0	1.70	1.80	2.10	.85	.68	.94
30	1.3	1.7	1.65	......	......	2.95	1.70	1.70	2.00	.83	.60	.95
31	1.3	......	1.65	2.00	......	3.00	......	1.65	......	.80	.60	......

NOTE.—No ice noted in December, 1910, and gage heights do not indicate any effect. River frozen Jan. 1 to about Mar. 3, when water began running over ice, which gradually broke away. Channel clear of ice and the first unaffected reading obtained Mar. 9.

Daily discharge, in second-feet, of Powder River near North Powder, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	17	24	68	....	370	54	38	115	4.4	1.6
2	17	24	76	....	426	49	37	109	3.3	1.6
3	17	24	85	....	343	47	61	104	3.9	1.6
4	19	24	94	....	317	39	115	76	4.4	2.4
5	19	24	104	....	304	33	111	61	5.0	3.3
6	22	24	115	....	265	32	115	53	5.4	3.7
7	22	24	104	....	252	32	139	48	5.4	4.4
8	22	24	94	....	239	31	168	40	5.4	4.1
9	22	24	104	370	239	31	218	34	4.4	4.1
10	22	34	104	343	213	30	239	27	4.4	3.7
11	19	43	76	343	187	30	304	27	3.7	3.9
12	19	48	61	317	175	27	343	27	3.7	4.4
13	19	48	61	291	163	24	454	27	3.7	4.8
14	19	48	61	291	151	24	544	27	3.3	5.2
15	22	48	61	239	139	44	514	19	3.3	5.4
16	22	43	61	239	139	81	514	17	3.3	5.9
17	24	43	54	239	104	85	426	17	3.3	5.9
18	24	43	48	291	90	89	239	17	3.3	6.2
19	24	43	48	291	67	92	163	13	3.3	6.4
20	24	43	43	304	68	115	139	11	3.3	6.7
21	22	48	43	304	68	115	343	11	3.3	6.7
22	22	61	54	304	68	104	239	9.5	3.3	7.0
23	22	68	54	370	68	94	265	9.5	3.3	7.5
24	22	76	68	484	68	94	239	9.5	3.3	7.7
25	22	68	68	606	64	85	163	8.9	3.3	8.0
26	19	48	61	544	64	81	115	8.0	3.5	8.0
27	22	52	48	514	62	85	115	6.7	3.5	8.0
28	22	52	43	454	62	83	187	6.7	3.3	8.6
29	24	52	48	370	61	76	139	6.7	3.0	9.2
30	24	61	54	356	61	61	115	6.2	1.6	9.5
31	24	....	54	370	....	54	....	5.4	1.6	....

NOTE.—Discharge determined from a rating curve well defined between 15 and 1,000 second-feet. Discharge Jan. 1 to Mar. 8 can be estimated approximately by taking about twice the discharge at Salisbury.

Monthly discharge of Powder River near North Powder, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off.	Accuracy.
	Maximum.	Minimum.	Mean.	(Total in acre-feet.)	
October	24	17	21.3	1,310	A.
November	76	24	42.9	2,550	A.
December	115	43	68.3	4,200	C.
March 9-31	606	239	358	16,300	A.
April	426	61	163	9,700	A.
May	115	24	62.0	3,810	A.
June	544	37	227	13,500	A.
July	115	5.4	30.9	1,900	B.
August	5.4	1.6	3.65	224	C.
September	9.5	1.6	5.52	328	C.

NOTE.—Jan. 1 to Mar. 8 estimated at 4,260 acre-feet by taking twice the run-off at Salisbury. Total in acre-feet for the year is then 58,100.

EAGLE CREEK ABOVE WEST FORK, NEAR BAKER, OREG.

Location.—In sec. 21, T. 6 S., R. 43 E., one-fourth mile above mouth of West Fork and 2½ miles by trail northeast of the Basin mine, 35 miles northeast of Baker.

Records available.—July 24 to September 2, 1911. With the addition of West Fork records at the station give the same results as the station below, which was maintained May 20 to September 29, 1909, March 1 to September 10, 1910, and June 21 to July 23, 1911. Records at the lower station for 1911 are of no value on account of unfavorable conditions.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Rocky; practically permanent.

Discharge measurements.—Made from cable and car, or by wading. Conditions at cable unfavorable for accurate measurements.

Winter flow.—Probably affected by ice.

Diversions.—Sparta ditch diverts some water above station.

Cooperation.—Gage readings furnished by Powder Land & Irrigation Co.

Estimates withheld for additional data.

The following discharge measurement was made by R. W. Davenport:

July 24, 1911: Gage height, 1.18 feet; discharge, 45.3 second-feet.

Daily gage height, in feet, of Eagle Creek above West Fork, near Baker, Oreg., for the year ending Sept. 30, 1911.

Day.	July.	Aug.	Sept.	Day.	July.	Aug.	Sept.	Day.	July.	Aug.	Sept.
1	......	1.10	0.95	11	......	1.05	......	21	......	1.00	......
2	......	1.10	.95	12	......	1.05	......	22	......	1.00	......
3	......	1.10	......	13	......	1.05	......	23	......	1.00	......
4	......	1.10	......	14	......	1.05	......	24	1.18	1.00	......
5	......	1.08	......	15	......	1.02	......	25	1.20	1.00	......
6	......	1.08	......	16	......	1.02	......	26	1.20	1.00	......
7	......	1.08	......	17	......	1.02	......	27	1.15	.98	......
8	......	1.08	......	18	......	1.02	......	28	1.15	.98	......
9	......	1.05	......	19	......	1.00	......	29	1.12	.95	......
10	......	1.05	......	20	......	1.00	......	30	1.10	.95	......
								31	1.10	.95	......

WEST FORK OF EAGLE CREEK NEAR BAKER, OREG.

Location.—In the NW. ¼ sec. 21, T. 6 S., R. 43 E.; one-third mile above mouth and 1½ miles northeast of the Basin mine, 35 miles northeast of Baker.

Records available.—July 24 to September 2, 1911.

Drainage area.—Not measured.

Gage.—Readings obtained by measuring down from a reference point.

Channel.—Rocky; practically permanent.

Discharge measurements.—Made from foot log or by wading.

Winter flow.—Probably affected by ice.

Diversions.—Sparta ditch diverts from Eagle Creek and from West Fork above the stations on both streams. Ditch was carrying 14.5 second-feet July 24, 1911.

Cooperation.—Gage readings furnished by Powder Land & Irrigation Co.

Estimates withheld for additional measurements.

The following discharge measurement was made by R. W. Davenport:

July 24, 1911: Gage height, 1.45 feet; discharge, 10.1 second-feet.

Daily gage height, in feet, of West Fork of Eagle Creek near Baker, Oreg., for the year ending Sept. 30, 1911.

Day.	July.	Aug.	Sept.	Day.	July.	Aug.	Sept.	Day.	July.	Aug.	Sept.
1	......	1.2	1.0	11	......	1.1	......	21	......	1.0	......
2	......	1.2	1.0	12	......	1.1	......	22	......	1.0	......
3	......	1.25	......	13	......	1.1	......	23	......	1.0	......
4	......	1.25	......	14	......	1.1	......	24	1.45	1.0	......
5	......	1.15	......	15	......	1.05	......	25	1.5	1.0	......
6	......	1.15	......	16	......	1.05	......	26	1.5	1.0	......
7	......	1.15	......	17	......	1.05	......	27	1.45	1.0	......
8	......	1.15	......	18	......	1.05	......	28	1.45	1.0	......
9	......	1.15	......	19	......	1.05	......	29	1.45	1.0	......
10	......	1.1	......	20	......	1.05	......	30	1.4	1.0	......
								31	1.3	1.0	......

SALMON RIVER NEAR PIERSON, IDAHO.

Location.—In sec. 1 (approximate), T. 8 N., R. 13 E. Boise meridian, at George Achen's ranch, about 4½ miles below Pierson post office. Fourth of July Creek enters about one-half mile above the station and Lake Creek (outlet to Redfish Lakes) about 12 miles below.

Records available.—December 23, 1910, to June 4, 1911.

Drainage area.—Not measured.

Gage.—Originally a vertical staff on right bank, opposite a lone pine tree on the left bank about 300 yards from Achen's house. June 5, 1911, this gage was washed out and was replaced on August 4 by a sloping gage at same point. Readings on the new gage were begun September 24. Relation of the new datum to the old not definitely known.

Channel.—Coarse gravel; should be permanent.

Discharge measurements.—Made from a cable and car or, during low stages, by wading.

Winter flow.—Ice exists along the shores of the stream, but the gage heights are not believed to be seriously affected thereby.

Diversions.—No diversions from the river in this vicinity.

Accuracy.—Reliable estimates from records on old gage are impossible because of lack of discharge measurements referred to that gage.

Discharge measurements of Salmon River near Pierson, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 29	O. W. Hartwell	[a] 2.45	668
Aug. 4	H. L. Stoner	[b] 2.30	391
Sept. 25	.....do	[b] 1.80	200

[a] Refers to old gage.

[b] Refers to new gage established Aug. 4, 1911.

Daily gage height, in feet, of Salmon River near Pierson, Idaho, for Dec. 23, 1910, to June 4, 1911.

[Glen Achen, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	Day.	Dec.	Jan.	Feb.	Mar.	Apr.	May.
1	1.6	1.5	1.5	1.6	2.3	2.9	16	......	1.5	1.5	1.5	1.5	2.6
2	1.6	1.5	1.5	1.5	2.2	3.0	17	......	1.5	1.5	1.5	1.5	2.6
3	1.5	1.7	1.5	1.5	2.3	3.1	18	......	1.5	1.5	1.5	1.6	2.7
4	1.5	1.6	1.5	1.5	2.3	3.2	19	......	1.5	1.5	1.5	1.6	2.7
5	1.5	1.6	1.5	1.5	2.4	......	20	......	1.5	1.5	1.5	1.6	2.8
6	1.5	1.6	1.5	1.5	2.5	......	21	......	1.5	1.5	1.5	1.6	2.8
7	1.5	1.5	1.5	1.5	2.4	......	22	......	1.5	1.5	1.5	1.7	2.8
8	1.5	1.5	1.5	1.5	2.4	......	23	1.5	1.6	1.5	1.5	1.7	2.7
9	1.5	1.6	1.5	1.5	2.45	......	24	1.5	1.5	1.5	1.5	1.8	2.8
10	1.5	1.6	1.5	1.5	2.4	......	25	1.5	1.5	1.5	1.5	1.8	2.8
11	1.5	1.6	1.5	1.5	2.4	......	26	1.5	1.5	1.5	1.5	1.8	2.8
12	1.5	1.6	1.5	1.5	2.5	......	27	1.5	1.5	1.5	1.5	1.9	2.8
13	1.5	1.5	1.5	1.5	2.5	......	28	1.5	1.5	1.5	1.5	2.0	2.8
14	1.5	1.5	1.5	1.5	2.6	......	29	1.5	1.5	......	1.5	2.1	2.8
15	1.5	1.5	1.5	......	2.6	......	30	1.5	1.5	......	1.5	2.2	2.8
							31	1.5	1.5	......	1.5	......	2.8

NOTE.—Records refer to gage installed Dec. 22, 1910, which was destroyed by high water June 5, 1911.

SALMON RIVER AT WHITEBIRD, IDAHO.

Location.—In sec. 22, T. 28 N., R. 1 E., at ferry at Whitebird, just below Whitebird Creek and below all important tributaries.

Records available.—August 18, 1910, to September 30, 1911.

Drainage area.—13,600 square miles.

Gage.—Inclined staff near ferry.

Channel.—Practically permanent.

Discharge measurements.—From car on ferry cable.

Winter flow.—Not seriously affected by ice.

Diversions.—None.

Accuracy.—Rating curve well defined; records probably excellent.

Discharge measurements of Salmon River at Whitebird, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
1910. Oct. 12	F. C. Ebert	3.94	7,980	1911. May 27[a]	F. C. Ebert	9.90	30,300
				June 22[a]	do	16.05	62,500
1911. Mar. 6	J. P. Martin	1.95	3,910	July 20	E. W. Kramer	6.27	14,600

[a] Surface velocity observed and coefficient of 0.85 used to reduce to mean velocity.

Daily gage height, in feet, of Salmon River at Whitebird, Idaho, for the year ending Sept. 30, 1911.

[S. Overton, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.15	2.4	3.1	1.9	2.5	1.9	4.3	......	11.3	11.7	4.4	2.3
2	2.25	2.4	2.9	1.7	2.8	1.7	5.2	......	12.5	11.3	4.4	2.5
3	2.3	2.4	3.0	1.8	2.7	1.6	5.5	......	13.9	10.7	4.3	2.6
4	2.8	2.45	3.0	1.7	2.5	1.5	5.2	......	14.7	10.3	4.4	2.6
5	3.25	2.5	3.0	1.7	2.2	1.9	5.1	......	15.4	10.1	4.4	2.7
6	3.0	2.3	2.9	2.0	2.2	2.0	4.9	......	14.8	10.1	4.2	2.9
7	2.9	2.25	2.9	2.1	2.2	2.1	4.4	......	15.3	10.0	4.2	3.2
8	2.8	2.4	3.0	2.7	2.2	2.2	4.2	......	16.7	9.7	4.1	3.1
9	2.75	2.85	2.9	2.6	2.2	2.3	4.2	......	16.3	9.2	3.9	3.0
10	2.7	2.8	2.6	2.3	2.1	2.3	4.2	......	15.3	8.8	3.9	2.8
11	2.6	3.0	2.7	2.2	2.0	2.4	4.1	......	15.1	......	3.7	2.8
12	2.5	3.8	2.6	2.1	2.1	2.4	4.0	......	16.6	......	3.6	2.8
13	2.5	3.7	2.5	2.0	2.2	2.5	3.9	......	17.9	......	3.5	2.7
14	2.5	3.5	2.3	2.0	2.2	2.6	3.8	......	18.4	......	3.4	2.6
15	2.6	3.4	1.9	1.9	2.2	2.5	3.6	8.8	18.6	......	3.4	2.6
16	2.55	3.1	1.7	2.0	2.1	2.6	3.3	9.9	18.2	......	3.3	2.6
17	2.6	2.8	1.5	1.9	2.0	2.7	3.4	10.4	17.6	......	3.2	2.6
18	2.6	2.8	1.5	1.9	1.8	3.0	3.6	10.2	17.3	......	3.1	2.6
19	2.8	2.9	1.6	1.8	1.9	3.2	3.8	9.9	17.2	......	3.0	2.6
20	2.85	2.9	1.8	1.8	2.0	3.5	3.9	9.4	17.2	6.4	3.0	2.6
21	2.6	3.0	1.7	2.0	1.9	3.8	4.0	8.8	16.6	6.1	3.0	2.6
22	2.5	3.0	1.9	2.1	1.7	4.1	4.2	......	16.0	5.9	2.9	2.5
23	2.45	3.1	2.1	2.3	1.6	4.3	4.4	9.0	15.4	5.8	2.8	2.5
24	2.4	3.2	2.2	1.7	1.6	4.3	4.9	9.4	15.0	5.5	2.8	2.5
25	2.4	3.1	2.4	1.6	1.5	4.4	5.6	10.0	13.8	5.3	2.8	2.5
26	2.45	3.0	2.3	1.6	2.0	4.0	6.3	10.0	12.7	5.3	2.8	2.5
27	2.5	2.8	2.4	1.6	2.0	3.7	......	9.8	11.8	5.1	2.7	2.5
28	2.4	2.7	2.3	1.7	2.0	3.5	......	9.6	12.4	5.0	2.7	2.4
29	2.35	2.9	2.1	2.0	......	3.4	......	9.1	12.3	4.7	2.6	2.4
30	2.35	3.0	2.0	2.2	......	3.5	......	9.3	12.1	4.8	2.6	2.4
31	2.3	......	2.1	2.7	......	3.7	......	10.1	......	4.4	2.6	......

Daily discharge, in second-feet, of Salmon River at Whitebird, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	4,230	4,630	6,020	3,850	4,800	3,850	8,850	16,700	37,400	39,500	9,110	4,470
2	4,390	4,630	5,580	3,570	5,370	3,570	11,300	17,500	43,600	37,400	9,110	4,800
3	4,470	4,630	5,800	3,710	5,170	3,430	12,200	19,100	51,000	34,400	8,850	4,980
4	5,370	4,720	5,800	3,570	4,800	3,290	11,300	21,200	55,200	32,300	9,110	4,980
5	6,350	4,800	5,800	3,570	4,310	3,850	11,000	24,300	58,900	31,300	9,110	5,170
6	5,800	4,470	5,580	4,000	4,310	4,000	10,400	27,900	55,700	31,300	8,600	5,580
7	5,580	4,390	5,580	4,150	4,310	4,150	9,110	30,300	58,400	30,800	8,600	6,240
8	5,370	4,630	5,800	5,170	4,310	4,310	8,600	30,300	65,900	29,300	8,350	6,020
9	5,270	5,480	5,580	4,980	4,310	4,470	8,600	29,300	63,700	27,000	7,860	5,800
10	5,170	5,370	4,980	4,470	4,150	4,470	8,600	26,600	58,400	25,200	7,860	5,370
11	4,980	5,800	5,170	4,310	4,000	4,630	8,350	24,300	57,300	24,200	7,380	5,370
12	4,800	7,620	4,980	4,150	4,150	4,630	8,100	23,400	65,300	23,200	7,150	5,370
13	4,800	7,380	4,800	4,000	4,310	4,800	7,860	23,800	72,400	22,200	6,920	5,170
14	4,800	6,920	4,470	4,000	4,310	4,980	7,620	24,700	75,100	21,200	6,690	4,980
15	4,980	6,690	3,850	3,850	4,310	4,800	7,150	25,200	76,200	20,200	6,690	4,980
16	4,890	6,020	3,570	4,000	4,150	4,980	6,460	30,300	74,000	19,300	6,460	4,980
17	4,980	5,370	3,290	3,850	4,000	5,170	6,690	32,800	70,700	18,300	6,240	4,980
18	4,980	5,480	3,290	3,850	3,710	5,800	7,150	31,800	69,100	17,300	6,020	4,980
19	5,370	5,580	3,430	3,710	3,850	6,240	7,620	30,300	68,600	16,300	5,800	4,980
20	5,480	5,580	3,710	3,710	4,000	6,920	7,860	27,900	68,600	15,300	5,800	4,980
21	4,980	5,800	3,570	4,000	3,850	7,620	8,100	25,200	65,300	14,200	5,800	4,980
22	4,800	5,800	3,850	4,150	3,570	8,350	8,600	25,600	62,100	13,600	5,580	4,800
23	4,720	6,020	4,150	4,470	3,430	8,850	9,110	26,100	58,900	13,200	5,370	4,800
24	4,630	6,240	4,310	3,570	3,430	8,850	10,400	27,900	56,800	12,200	5,370	4,800
25	4,630	6,020	4,630	3,430	3,290	9,110	12,500	30,800	50,400	11,600	5,370	4,800
26	4,720	5,800	4,470	3,430	4,000	8,100	14,900	30,800	44,600	11,600	5,370	4,800
27	4,800	5,370	4,630	3,430	4,000	7,380	17,500	29,800	40,000	11,000	5,170	4,800
28	4,630	5,170	4,470	3,570	4,000	6,920	17,100	28,900	43,100	10,700	5,170	4,630
29	4,550	5,580	4,150	4,000	......	6,690	16,400	26,600	42,600	9,890	4,980	4,630
30	4,550	5,800	4,000	4,310	......	6,920	16,400	27,500	41,500	10,200	4,980	4,630
31	4,470	......	4,150	5,170	......	7,380	......	31,300	......	9,110	4,980	......

NOTE.—Discharge determined from a rating curve well defined between 3,500 and 65,000 second-feet. Discharge Apr. 27 to May 14 interpolated by comparison with records of Clearwater River near Lewiston, Idaho. Discharge July 11 to 19 obtained by straight interpolation.

Monthly discharge of Salmon River at Whitebird, Idaho, for the year ending Sept. 30, 1911.

[Drainage area, 13,600 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	6,350	4,230	4,950	0.364	0.42	304,000	A.
November	7,620	4,390	5,590	.411	.46	333,000	A.
December	6,020	3,290	4,630	.340	.39	285,000	A.
January	5,170	3,430	4,000	.294	.34	246,000	A.
February	5,370	3,290	4,150	.305	.32	230,000	A.
March	9,110	3,290	5,760	.424	.49	354,000	A.
April	17,500	6,460	10,200	.750	.84	607,000	A.
May	32,800	16,700	26,700	1.96	2.26	1,640,000	B.
June	76,200	37,400	58,400	4.29	4.79	3,480,000	A.
July	39,500	9,110	20,800	1.53	1.76	1,280,000	A.
August	9,110	4,980	6,770	.498	.57	416,000	A.
September	6,240	4,470	5,060	.372	.42	301,000	A.
The year	76,200	3,290	13,100	.962	13.06	9,480,000	

LAKE CREEK NEAR STANLEY, IDAHO.

Location.—In sec. 2 (approximate), T. 9 N., R. 13 E. Boise meridian; about one-fourth mile below the outlet of Little Redfish Lake and about one-fourth mile above the junction of the creek with Salmon River, about 100 yards above the bridge on the road from Stanley to Pierson; about 8 miles above Stanley post office. No tributaries between the lake and the river.

Records available.—December 23, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on left bank.

Channel.—Gravel; should be permanent.

Discharge measurements.—Made by wading.

Winter flow.—Gage heights somewhat affected by ice.

Diversions.—No diversions from the creek.

Accuracy.—Rating curve well defined; results should be good.

Discharge measurements of Lake Creek near Stanley, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 29	O. W. Hartwell	2.14	136
Aug. 3	H. L. Stoner	2.35	170
Sept. 26	.....do	1.62	49.5

Daily gage height, in feet, of Lake Creek near Stanley, Idaho, for the year ending Sept. 30, 1911.

[L. S. Niece and George Hoffman, observers.]

Day.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	Aug.	Sept.
1						1.72		2.5	
2		1.4						2.5	
3			1.7	1.5					
4					1.5	1.8			
5							3.0		1.8
6		1.4		1.45			3.1		1.8
7							3.0		
8			1.6		1.6		3.0	2.3	
9						2.02		2.3	
10		1.4		1.45					
11			1.55						
12					1.6	2.05			1.7
13				1.45					1.7
14		1.45	1.55						
15					1.58			1.9	
16						2.12		1.9	
17		1.5		1.45	1.6				
18			1.5						
19									1.7
20						2.2			1.7
21		1.5	2.2	1.45					
22					1.6	2.15		1.8	
23	1.45	1.7	1.5					1.8	
24					1.62				
25				1.45		2.2			
26									1.7
27	1.45	1.5	2.3						1.65
28				1.5					
29					1.7	2.15		1.7	
30		1.55				1.9		1.7	
31	1.45			1.5		1.9			

NOTE.—Gage heights affected by ice Jan. 23, Feb. 22, and Feb. 27.

Daily discharge, in second-feet, of Lake Creek near Stanley, Idaho, for the year ending Sept. 30, 1911.

Day.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	Aug.	Sept.
1		34	54	41	41	64	150	218	66
2		32	58	41	41	67	213	218	68
3		32	62	41	41	70	276	209	70
4		32	60	40	41	74	339	200	72
5		32	58	38	44	81	402	191	74
6		32	56	36	46	88	445	182	74
7		32	54	36	48	95	402	173	72
8		32	51	36	51	102	402	165	70
9		32	50	36	51	108		165	68
10		32	48	36	51	110		152	66
11		33	46	36	51	112		140	64
12		34	46	36	51	113		127	62
13		35	46	36	50	116		114	62
14		36	46	36	50	119		101	62
15		38	45	36	49	122		88	62
16		40	44	36	50	126		88	62
17		41	42	36	51	130		86	62
18		41	41	36	51	134		84	62
19		41	41	36	51	138		82	62
20		41	41	36	51	142		80	62
21		41	41	36	51	137		77	62
22		41	41	36	51	132		74	62
23	36	41	41	36	52	135		74	62
24	36	41	41	36	53	138		72	62
25	36	41	41	36	54	142		70	62
26	36	41	41	38	56	140		68	62
27	36	41	41	40	58	137		66	62
28	36	42	41	41	60	134		64	62
29	36	44		41	62	132		62	62
30	36	46		41	63	88		62	62
31	36	50		41		88		64	

NOTE.—Discharge determined from a well-defined curve based on measurements made during 1911 and 1912. Discharges interpolated for missing days and for days affected by ice. Mean discharge June 9 to 30 estimated at 345 second-feet; mean for July estimated at 250 second-feet.

Monthly discharge of Lake Creek near Stanley, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
December 23-31	36	36	36.0	642	C.
January	50	32	37.8	2,320	C.
February	62	41	47.0	2,610	C.
March	41	36	37.5	2,310	B.
April	63	41	50.7	3,020	B
May	142	64	113	6,950	B.
June	445		341	20,300	D.
July			250	15,400	D.
August	218	62	117	7,190	B.
September	74	62	64.7	3,850	B.
The period				64,600	

NOTE.—See footnote to daily discharge table.

VALLEY CREEK NEAR STANLEY, IDAHO.

Location.—At Benner's ranch, about 500 feet from the house, in sec. 9 (approximate), T. 10 N., R. 13 E. Boise meridian, about 1 mile above the mouth, below all tributaries, and about 2 miles from Stanley post office.

Records available.—December 21, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Present gage, installed May 28, 1911, is a vertical staff on right bank. The original gage, washed out May 5, 1911, was located in the forest ranger's pasture about one-half mile below the present gage at the present site of the cable and auxiliary gage. Relation between the first and second gages not determined.

Channel.—Gravel; probably shifting. Two channels at present gage during extreme high water.

Discharge measurements.—Made from a bridge at Benner's ranch, from the cable, or by wading.

Diversions.—No important diversions above the station.

Winter flow.—Affected by ice to some extent.

Accuracy.—No measurements referred to the first gage and no estimates possible for December 21 to May 5. Results from records on the second gage are believed to be good.

Discharge measurements of Valley Creek near Stanley, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 28	O. W. Hartwell	3.30	486
Aug. 2	H. L. Stoner	2.50	245
Sept. 28	.....do	1.99	108

NOTE.—These measurements are referred to the second gage, established May 28, 1911.

Daily gage height, in feet, of Valley Creek near Stanley, Idaho, for the year ending Sept. 30, 1911.

[Mrs. H. L. Benner, observer.]

Day.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1						3.2	3.85		2.5	2.05
2		2.5	2.6	2.4	2.5	3.3	3.95	4.0	2.5	2.05
3						3.8	4.0	3.9	2.5	2.05
4		2.5	2.4	2.4	2.5	4.1	4.25	3.9	2.5	2.05
5							4.1	3.8	2.5	2.05
6		2.4	2.4	2.4	2.5		4.15	3.7	2.5	2.05
7				2.4			4.25	3.6	2.45	2.05
8		2.4	2.4		2.5		4.75	3.6	2.45	2.05
9				2.4			4.45	3.6	2.45	2.05
10		2.4	2.4		2.5		4.3	3.5	2.4	2.05
11				2.4			4.35	3.4	2.4	2.05
12			2.4		2.4		4.35	3.2	2.35	2.05
13		2.4		2.4			4.8	3.0	2.35	2.05
14			2.4		2.4		4.8	2.8	2.3	2.05
15		2.4		2.3			4.8	2.6	2.3	2.05
16			2.4		2.5		4.9	2.6	2.3	2.05
17		2.4		2.3			4.8	2.6	2.25	2.05
18			2.4		2.5		4.85	2.6	2.25	2.0
19		2.4		2.3			4.9	2.5	2.25	2.0
20			2.4		2.5		4.85	2.5	2.0	2.0
21	2.5	2.5		2.3			4.8	2.5	2.15	2.0
22			2.4		2.6		4.8	2.5	2.15	2.0
23		2.4		2.4	2.6		4.75	2.5	2.15	2.0
24	2.6		2.4				4.65	2.5	2.15	2.0
25		2.5		2.4	2.6		4.55	2.5	2.15	2.0
26	2.6		2.4		2.7		4.5	2.5	2.1	2.0
27		2.5		2.4	2.8		4.25	2.5	2.1	2.0
28	2.5		2.4		2.9	3.3	4.15	2.5	2.1	2.0
29		2.7		2.4	3.0	3.35	4.1	2.5	2.05	2.0
30					3.1	3.65	4.0	2.5	2.05	2.0
31	2.5	2.6		2.5		3.75		2.5	2.05	

NOTE.—Gage heights Dec. 21 to May 4 refer to first gage. Gage heights May 28 to Sept. 30 refer to gage established May 28 at new location and datum.

Daily discharge, in second-feet, of Valley Creek near Stanley, Idaho, for the year ending Sept. 30, 1911.

Day.	May.	June.	July.	Aug.	Sept.	Day.	May.	June.	July.	Aug.	Sept.
1		678	730	236	124	16		1,060	264	183	124
2		712	730	236	124	17		1,030	264	170	124
3		730	695	236	124	18		1,040	264	170	114
4		818	695	236	124	19		1,060	236	170	114
5		765	660	236	124	20		1,040	236	114	114
6		782	625	236	124	21		1,030	236	146	114
7		818	590	222	124	22		1,030	236	146	114
8		1,010	590	222	124	23		1,010	236	146	114
9		893	590	222	124	24		969	236	146	114
10		837	555	209	124	25		931	236	146	114
11		856	520	209	124	26		912	236	135	114
12		856	452	196	124	27		818	236	135	114
13		1,030	386	196	124	28	486	782	236	135	114
14		1,030	323	183	124	29	503	765	236	124	114
15		1,030	264	183	124	30	608	730	236	124	114
						31	642		236	124	

NOTE.—Discharge determined from a fairly well-defined rating curve.

Monthly discharge of Valley Creek near Stanley, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
June	1,060	678	902	53,700	B.
July	730	236	396	24,300	B.
August	236	114	180	11,100	B.
September	124	114	120	7,140	B.
The period				96,200	

PAHSIMEROI RIVER NEAR GOLDBURG, IDAHO.

Location.—In sec. 19, T. 11 N., R. 24 E. Boise meridian, near a large dead tree standing on the left bank; about three-fourths of a mile northwest of McJilton's house, about 10 miles southwest of Goldburg post office, and about 1 mile above the mouth of Burnt Creek.

Records available.—January 30, 1910, to September 30, 1911.

Gage.—On April 12, 1910, a new vertical staff gage was installed on the right bank about 30 feet below the old one which was at the dead tree. Gage heights prior to April 12 have been referred to the new gage by comparative readings.

Channel.—Gravel, and probably permanent.

Discharge measurements.—By wading or, when necessary, from a cable.

Winter flow.—Ice forms in winter months from 2 to 5 feet thick and flow decreases at times to practically nothing.

Diversions.—Wells ditch diverts water about 4 miles below the station and carries it over a low divide into Goldburg Creek.

Accuracy.—Rating curve well defined; open-channel records are reliable.

Discharge measurements of Pahsimeroi River near Goldburg, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910		*Feet.*	*Sec.-ft.*	1911		*Feet.*	*Sec.-ft.*
Oct. 2	H. L. Stoner	5.75	18	June 5	O. W. Hartwell	6.29	62.6
2	do	5.75	17	Sept. 9	H. L. Stoner	5.80	21

Daily gage height, in feet, of Pahsimeroi River near Goldburg, Idaho, for the year ending Sept. 30, 1911.

[E. E. McJilton, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	May.	June.	July.	Aug.	Sept.
1	5.8	5.7	5.7	4.7	5.1	6.1	6.9	6.1	5.9
2	....	5.7	5.7	4.2	5.2	6.2	6.9	6.1	5.9
3	5.8	5.7	5.7	4.7	5.3	6.3	6.7	6.1	5.9
4	5.8	5.7	5.7	....	5.3	6.6	6.9	6.1	5.9
5	5.7	5.7	5.7	....	5.4	6.4	7.2	6.1	5.9
6	5.7	5.7	5.7	....	5.5	6.3	7.5	6.0	5.9
7	5.7	5.7	5.8	....	5.5	6.8	7.5	6.0	5.9
8	5.7	5.6	5.8	....	5.5	6.6	7.5	6.0	5.9
9	5.7	5.6	5.8	....	5.5	6.3	6.7	6.0	5.9
10	5.7	5.6	5.7	....	5.6	6.3	6.6	6.0	5.9
11	5.7	5.6	5.8	....	5.7	7.0	6.5	6.0	5.9
12	5.7	5.5	5.8	....	5.7	7.6	6.5	6.0	5.9
13	5.7	5.5	5.7	....	5.8	7.9	6.6	6.0	5.9
14	5.7	5.5	5.8	....	5.7	8.1	6.8	6.0	5.9
15	5.7	5.5	5.8	....	5.7	8.0	6.8	6.0	5.9
16	5.7	5.6	5.8	....	5.7	8.1	6.7	5.9	5.9
17	5.7	5.6	5.8	....	5.6	8.0	6.7	5.9	5.9
18	5.7	5.6	5.8	....	5.6	8.2	6.7	5.9	5.9
19	5.7	5.6	5.8	....	5.6	8.2	6.7	5.9	5.9
20	5.7	5.6	5.7	....	5.6	8.2	6.7	5.9	5.8
21	5.7	5.7	5.6	....	5.7	8.5	6.7	5.9	5.8
22	5.7	5.7	5.5	....	5.7	8.1	6.7	5.9	5.8
23	5.7	5.7	5.4	....	5.7	8.1	6.7	5.9	5.7
24	5.7	5.7	5.4	....	5.7	8.1	6.6	5.9	5.7
25	5.7	5.7	5.3	....	5.7	7.5	6.6	5.9	5.7
26	5.7	5.7	5.3	....	5.7	7.1	6.5	5.9	5.7
27	5.7	5.7	5.2	....	5.7	7.1	6.5	5.9	5.7
28	5.7	5.7	5.1	....	5.7	7.3	6.4	5.9	5.7
29	5.7	5.7	5.0	....	5.8	6.9	6.4	5.9	5.7
30	5.7	5.7	4.9	....	5.9	7.1	6.2	5.9	5.7
31	5.7	....	4.7	....	6.0	....	6.1	5.9	....

NOTE.—Gage heights affected by ice from about Dec. 7 to Jan. 3. No record obtained Jan. 4 to Apr. 30. The stream was frozen to the bottom, and there was probably no flow during this period. The observer reported no flow on Jan. 4 and also during latter part of April.

Daily discharge, in second-feet, of Pahsimeroi River near Goldburg, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	May.	June.	July.	Aug.	Sept.
1	19	14	14	1.2	42	162	42	25
2	19	14	14	2.0	52	162	42	25
3	19	14	14	3.2	63	123	42	25
4	19	14	14	3.2	106	162	42	25
5	14	14	14	4.8	76	227	42	25
6	14	14	14	7.0	63	297	33	25
7	14	14	10	7.0	142	297	33	25
8	14	10	10	7.0	106	297	33	25
9	14	10	10	7.0	63	123	33	25
10	14	10	10	10	63	106	33	25
11	14	10	10	14	183	90	33	25
12	14	7	10	14	322	90	33	25
13	14	7	10	19	401	106	33	25
14	14	7	10	14	455	142	33	25
15	14	7	10	14	428	142	33	25
16	14	10	10	14	455	123	25	25
17	14	10	10	10	428	123	25	25
18	14	10	10	10	483	123	25	25
19	14	10	10	10	483	123	25	25
20	14	10	10	10	483	123	25	19
21	14	14	5	14	567	123	25	19
22	14	14	5	14	455	123	25	19
23	14	14	5	14	455	123	25	14
24	14	14	5	14	455	106	25	14
25	14	14	5	14	297	106	25	14
26	14	14	5	14	205	90	25	14
27	14	14	5	14	205	90	25	14
28	14	14	2	14	250	76	25	14
29	14	14	2	19	162	76	25	14
30	14	14	2	25	205	52	25	14
31	14	....	2	33	....	42	25	....

NOTE.—Discharge Oct. 1 to Dec. 6 and May 1 to Sept. 30 determined from a well-defined rating curve. Discharge estimated Dec. 7 to 31.

Monthly discharge of Pahsimeroi River near Goldburg, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	19	14	14.6	898	A.
November	14	7	11.9	708	A.
December	14	2	8.6	529	C.
May	33	1.2	11.9	732	B.
June	567	42	272	16,200	A.
July	297	42	134	8,240	A.
August	42	25	30.3	1,860	A.
September	25	14	21.5	1,280	B.

BIG CREEK NEAR PATTERSON, IDAHO.

Location.—On unsurveyed land approximately in sec. 18, T. 13 N., R. 24 E. Boise meridian, at the mouth of the canyon and directly down the hill from Carey's mine, about 8 miles north of Goldburg post office and about 6 miles southeast of Patterson; below all important tributaries.

Records available.—January 28, 1910, to September 30, 1911.

Gage.—Vertical staff on left bank.

Channel.—Rocky; should be permanent.

Discharge measurements.—Made from a footbridge at high stages and by wading at low water.

Winter flow.—Affected slightly by ice.

Diversions.—A large part of the flow sinks or is used for irrigation before reaching Pahsimeroi River. A diversion is proposed just below the station to carry the water into a proposed reservoir on Goldburg Creek.

Accuracy.—Rating curve fairly well defined; records reliable.

Discharge measurements of Big Creek near Patterson, Idaho, for the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 1	H. L. Stoner	2.75	27	June 5	O. W. Hartwell	4.0	170
				Sept. 8	H. L. Stoner	2.9	28.4

Daily gage height, in feet, of Big Creek near Patterson, Idaho, for the year ending Sept. 30, 1911.

[Wilbur Nelson, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	3.3	2.8	3.1	2.8	2.9	2.8	2.9	2.9	3.6	4.0	3.1	......
2	3.0	2.8	3.1	2.8	2.9	2.8	2.9	2.9	3.9	4.0	3.1	2.9
3	2.8	2.8	3.2	2.8	3.0	2.8	2.9	2.9	4.1	3.9	3.1	......
4	2.8	2.8	3.2	2.8	3.0	2.8	2.9	3.0	4.3	3.7	3.1	......
5	2.9	2.8	3.2	2.9	3.0	2.8	2.9	3.0	4.4	3.7	3.1	2.9
6	2.9	2.8	3.2	2.9	3.0	2.8	2.9	3.1	4.3	3.5	3.1	......
7	2.8	2.8	3.1	2.9	3.0	2.8	2.9	3.1	4.3	3.6	3.1	2.8
8	2.8	2.9	3.2	2.9	2.9	2.9	2.9	3.2	4.3	3.6	3.1	......
9	2.8	2.9	3.2	2.9	2.9	2.9	2.9	3.2	4.2	3.6	3.1	2.8
10	2.9	2.9	3.2	2.9	2.9	2.9	2.9	3.2	4.2	3.5	3.1	......
11	3.1	2.9	3.2	2.9	2.9	2.9	2.9	3.1	4.5	3.5	3.0	2.9
12	3.2	2.9	3.2	2.9	2.9	2.9	2.9	3.1	4.8	3.5	3.0	......
13	3.2	2.9	3.1	2.9	2.9	2.9	2.9	3.2	5.4	3.5	3.0	2.9
14	3.1	2.9	3.1	3.0	2.9	2.9	2.9	3.2	5.4	3.4	3.0	......
15	3.2	2.9	3.1	3.0	2.9	2.9	2.9	3.3	5.4	3.4	3.0	......
16	3.2	2.9	3.1	3.1	2.9	2.9	2.9	3.3	5.5	3.4	2.9	2.9
17	3.1	2.9	3.1	3.1	3.0	2.9	2.9	3.3	5.4	3.4	2.9	2.8
18	3.0	2.9	3.1	3.0	3.0	2.9	2.9	3.3	5.3	3.3	2.9	......
19	3.0	2.9	3.1	3.0	3.0	2.9	2.9	3.2	5.0	3.3	2.9	2.8
20	2.9	2.9	3.0	3.0	2.9	2.9	2.9	3.1	4.9	3.3	2.9	......
21	2.9	2.9	3.0	2.9	2.9	2.9	2.9	3.1	4.9	3.2	2.9	......
22	2.9	3.0	3.0	2.9	2.8	2.9	2.9	3.2	4.7	3.2	2.9	......
23	2.9	3.0	2.9	2.9	2.8	2.9	2.9	3.3	4.5	3.2	2.9	2.9
24	2.9	3.1	2.9	2.9	2.8	2.9	2.9	3.5	4.3	3.2	2.9	......
25	2.8	3.1	2.9	3.0	2.8	2.9	2.9	3.5	4.9	3.1	2.9	2.9
26	2.8	3.1	2.9	3.0	2.8	2.9	2.9	3.4	4.7	3.1	2.8	......
27	2.8	3.1	2.8	3.1	2.8	2.9	2.9	3.2	4.5	3.1	......	2.8
28	2.8	3.0	2.8	3.1	2.8	2.9	2.9	3.3	4.1	3.1	2.8	......
29	2.8	3.0	2.8	3.1	......	2.9	2.9	3.1	4.1	3.1	2.8	2.8
30	2.8	3.0	2.8	3.1	......	2.9	2.9	3.2	4.0	3.1	......	......
31	2.8	......	......	2.9	......	2.9	......	3.4	......	3.1	2.8	......

NOTE.—Gage heights for December and January 14 to 20 probably affected by ice.

Daily discharge, in second-feet, of Big Creek near Patterson, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	68	30	27	33	27	33	33	104	168	48	30
2	42	30	27	33	27	33	33	150	168	48	33
3	30	30	27	40	27	33	33	188	150	48	33
4	30	30	27	40	27	33	40	235	118	48	33
5	35	30	33	40	27	33	40	263	118	48	33
6	35	30	33	40	27	33	48	235	90	48	30
7	30	30	33	40	27	33	48	235	104	48	27
8	30	35	33	33	33	33	57	235	104	48	27
9	30	35	33	33	33	33	57	210	104	48	27
10	35	35	33	33	33	33	57	210	90	48	30
11	50	35	33	33	33	33	48	294	90	40	33
12	58	35	33	33	33	33	48	392	90	40	33
13	58	35	33	33	33	33	57	608	90	40	33
14	50	35	33	33	33	33	57	608	78	40	33
15	58	35	33	33	33	33	67	608	78	40	33
16	58	35	33	33	33	33	67	644	78	33	33
17	50	35	33	40	33	33	67	608	78	33	27
18	42	35	33	40	33	33	67	572	67	33	27
19	42	35	33	40	33	33	57	464	67	33	27
20	35	35	33	33	33	33	48	428	67	33	28
21	35	35	33	33	33	33	48	428	57	33	30
22	35	42	33	27	33	33	57	358	57	33	32
23	35	42	33	27	33	33	67	294	57	33	33
24	35	50	33	27	33	33	90	235	57	33	33
25	30	50	40	27	33	33	90	428	48	33	33
26	30	50	40	27	33	33	78	358	48	27	30
27	30	50	48	27	33	33	57	294	48	27	27
28	30	42	48	27	33	33	67	188	48	27	27
29	30	42	48	......	33	33	48	188	48	27	27
30	30	42	48	......	33	33	57	168	48	27	24
31	30	......	33	......	33	......	78	......	48	27	......

NOTE.—Discharge determined from a rating curve fairly well defined except at high stages. Mean discharge estimated at 35 second-feet for December. Daily discharge Jan. 14 to 20 estimated. Discharge interpolated for days in August and September for which gage heights are missing.

Monthly discharge of Big Creek near Patterson, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	68	30	39.2	2,410	B.
November	50	30	37.0	2,200	B.
December	....	....	35.0	2,150	D.
January	48	27	34.6	2,130	B.
February	40	27	33.5	1,860	B.
March	33	27	31.6	1,940	B.
April	33	33	33.0	1,960	B.
May	90	33	57.0	3,500	B.
June	644	104	341	20,300	B.
July	168	48	82.6	5,080	A.
August	48	27	37.8	2,320	B.
September	33	24	30.2	1,800	B.
The year	644	....	65.8	47,600	

NOTE.—See footnote under daily discharge table.

GRANDE RONDE RIVER AT HILGARD, OREG.

Location.—In sec. 32, T. 2 S., R. 37 E., about half a mile east of Hilgard, just below Five Point Creek, at the county highway bridge, about 8 miles above head of Grande Ronde Valley.

Records available.—November 6, 1903, to March 3, 1910; October 1, 1910, to October 5, 1911.

Drainage area.—660 square miles.

Gage.—Vertical staff nailed to bridge abutment. Originally gage was attached to left abutment; old gage and bench mark were destroyed in 1910. Readings after October 1, 1910, made from a gage attached to right abutment and having no determined relation to the earlier gage.

Channel.—Sand and gravel. Probably permanent. One channel at all stages. Log driving formerly affected gage heights about two months in early summer, but no logs driven past station in 1911.

Discharge measurements.—Made from bridge or by wading.

Winter flow.—Severe ice conditions obtain for one or two months each winter.

Artificial control.—Practically no diversion and no storage above station.

Accuracy.—Results for 1910–11 good; those for previous years poor because of obstruction by logs and unfavorable conditions.

The following discharge measurement was made by E. A. Porter:

March 22, 1911: Gage height, 3.80 feet; discharge, 1,190 second-feet.

Daily gage height, in feet, of Grande Ronde River at Hilgard, Oreg., for Oct. 1, 1910, to Oct. 5, 1911.

[Owen Scott, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	1.5	1.6	2.0	1.8	1.8	2.0	4.0	2.8	3.1	2.6	1.6	1.5	1.6
2	1.6	1.6	2.1	1.8	1.8	2.0	4.0	2.8	3.2	2.4	1.6	1.5	1.7
3	1.6	1.6	2.2	1.8	1.7	2.1	3.8	2.9	3.1	2.4	1.6	1.6	1.7
4	1.6	1.6	2.6	1.8	1.7	2.3	3.6	2.8	3.0	2.4	1.8	1.6	1.8
5	1.8	1.6	2.7	1.8	1.7	2.2	3.3	2.8	2.9	2.4	1.8	1.7	1.8
6	1.8	1.6	2.6	1.8	1.7	2.2	3.1	2.9	2.9	2.4	1.7	1.7	......
7	1.7	1.6	2.4	1.8	1.7	2.4	3.0	2.8	2.8	2.3	1.6	1.8	......
8	1.6	1.7	2.2	1.8	1.7	2.6	3.0	2.8	2.8	2.2	1.6	1.8	......
9	1.6	1.8	2.0	1.8	1.7	2.4	2.9	2.9	2.8	2.2	1.6	1.7	......
10	1.6	1.9	1.9	1.8	1.7	2.4	2.9	2.8	2.8	2.1	1.6	1.7	......
11	1.6	2.0	1.8	1.8	1.7	2.4	2.8	2.8	2.7	2.1	1.6	1.7	......
12	1.6	2.0	1.7	1.8	1.7	2.4	2.8	2.7	2.7	2.0	1.6	1.7	......
13	1.6	1.9	1.7	1.7	1.7	2.6	2.8	2.8	2.8	1.9	1.6	1.7	......
14	1.6	1.9	1.7	1.7	1.8	2.7	2.8	2.8	2.7	1.9	1.6	1.7	......
15	1.6	1.8	1.7	1.7	1.8	2.9	2.8	2.8	2.7	1.9	1.6	1.7	......
16	1.6	1.7	1.7	1.6	1.9	3.3	2.7	2.9	2.7	1.8	1.6	1.7	......
17	1.7	1.7	1.8	1.6	2.0	3.4	2.6	3.2	2.7	1.8	1.55	1.6	......
18	1.7	1.8	1.8	1.6	2.1	3.5	2.5	3.4	2.6	1.7	1.55	1.6	......
19	1.7	1.8	1.8	1.7	2.1	3.6	2.6	3.6	2.5	1.7	1.55	1.6	......
20	1.6	1.8	1.8	1.7	2.1	3.8	2.7	3.4	2.4	1.7	1.55	1.6	......
21	1.6	1.8	1.8	1.7	2.2	3.8	2.7	3.4	2.4	1.7	1.55	1.6	......
22	1.6	1.9	1.8	1.6	2.2	3.8	2.7	3.3	2.4	1.7	1.55	1.6	......
23	1.6	1.8	1.9	1.6	2.2	3.8	2.8	3.2	2.4	1.7	1.55	1.6	......
24	1.6	1.9	1.9	1.6	2.2	3.8	2.9	3.2	2.4	1.7	1.55	1.6	......
25	1.7	1.9	1.9	1.6	2.2	3.8	3.0	3.2	2.3	1.6	1.5	1.55	......
26	1.7	1.9	1.9	1.7	2.2	3.6	3.0	3.1	2.2	1.6	1.5	1.55	......
27	1.6	1.9	1.9	1.7	2.1	3.2	3.0	3.1	2.4	1.6	1.5	1.55	......
28	1.6	1.9	1.9	1.7	2.0	3.0	2.9	3.0	2.6	1.6	1.5	1.55	......
29	1.6	2.0	1.9	1.7	......	2.9	2.9	3.0	2.8	1.6	1.5	1.55	......
30	1.6	2.0	1.9	1.7	......	3.2	2.9	2.9	2.6	1.6	1.5	1.55	......
31	1.5	......	1.9	1.7	......	3.6	......	3.0	......	1.6	1.5	......	......

NOTE.—River frozen Jan. 1 to Mar. 10, 1911. First unaffected gage reading Mar. 11

Daily discharge, in second-feet, of Grande Ronde River at Hilgard, Oreg., for Oct. 1, 1910, to Oct. 5, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	16	26	105	40	40	80	1,370	446	630	340	26	16	26
2	26	26	135	40	40	80	1,370	446	700	247	26	16	40
3	26	26	167	40	26	105	1,200	503	630	247	26	26	40
4	26	26	340	40	26	167	1,020	446	565	247	58	26	58
5	58	26	392	40	26	135	775	446	503	247	58	40	58
6	58	26	340	40	26	135	630	503	503	247	40	40	......
7	40	26	247	40	26	205	565	446	446	205	26	58	......
8	26	40	167	40	26	292	565	446	446	167	26	58	......
9	26	58	105	40	26	205	503	503	446	167	26	40	......
10	26	80	80	40	26	205	503	446	446	135	26	40	......
11	26	105	58	40	26	247	446	446	392	135	26	40	......
12	26	105	40	40	26	247	446	392	392	105	26	40	......
13	26	80	40	26	26	340	446	446	446	80	26	40	......
14	26	80	40	26	40	392	446	446	392	80	26	40	......
15	26	58	40	26	40	503	446	446	392	80	26	40	......
16	26	40	40	16	58	775	392	503	392	58	26	40	......
17	40	40	58	16	80	855	340	700	392	58	21	26	......
18	40	58	58	16	105	940	292	855	340	40	21	26	......
19	40	58	58	26	105	1,020	340	1,020	292	40	21	26	......
20	26	58	58	26	105	1,200	392	855	247	40	21	26	......
21	26	58	58	26	135	1,200	392	855	247	40	21	26	......
22	26	80	58	16	135	1,200	392	775	247	40	21	26	......
23	26	58	80	16	135	1,200	446	700	247	40	21	26	......
24	26	80	80	16	135	1,200	503	700	247	40	21	26	......
25	40	80	80	16	135	1,200	565	700	205	26	16	21	......
26	40	80	80	26	135	1,020	565	630	167	26	16	21	......
27	26	80	80	26	105	700	565	630	247	26	16	21	......
28	26	80	80	26	80	565	503	565	340	26	16	21	......
29	26	105	80	26	......	503	503	565	446	26	16	21	......
30	26	105	80	26	......	700	503	503	340	26	16	21	......
31	16	......	80	26	......	1,020	......	565	......	26	16	......	......

NOTE.—Discharge determined from a fairly well defined rating curve. Gage heights Jan. 1 to Mar. 10, 1911, reduced by 0.10 foot before applying open-channel rating curve.

Monthly discharge of Grande Ronde River at Hilgard, Oreg., for the year ending Sept. 30, 1911.

[Drainage area, 660 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	40	16	30.1	0.045	0.05	1,850	B.
November	105	26	61.6	.093	.10	3,670	B.
December	392	40	110	.167	.19	6,760	B.
January	40	16	29.2	.044	.05	1,800	D.
February	135	26	67.6	.102	.11	3,750	D.
March	1,200	80	601	.911	1.05	37,000	B.
April	1,370	292	581	.880	.98	34,600	B.
May	1,020	392	578	.876	1.01	35,500	B.
June	700	167	391	.592	.66	23,300	B.
July	340	26	107	.162	.19	6,580	B.
August	58	16	25.0	.038	.04	1,540	B.
September	58	16	31.1	.047	.05	1,850	B.
The year	1,370	16	218	.330	4.48	158,000	

GRANDE RONDE RIVER AT ELGIN, OREG.

Location.—In sec. 14, T. 1 N., R. 39 E., at the county bridge one-fourth mile east of the railroad station, at the lower end of the Grande Ronde Valley.

Records available.—November 18, 1903, to September 30, 1911.

Drainage area.—1,350 square miles.

Gage.—Chain gage.

Channel.—Heavy gravel and small bowlders; practically permanent; one channel.

Discharge measurements.—Made from bridge or at low water by wading.

Winter flow.—Affected by ice during considerable periods.

Diversions.—Large part of low-water flow diverted above the station for irrigation in the Grande Ronde Valley. No storage developed.

Accuracy.—Results fairly good but not of the highest degree of accuracy on account of unfavorable conditions.

No discharge measurements made during the year.

Daily gage height, in feet, of Grande Ronde River at Elgin, Oreg., for the year ending Sept. 30, 1911.

[John Graham, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.4	1.5	2.0	1.8	2.1	1.95	4.4	3.35	3.8	2.6	1.3	1.15
2	1.45	1.5	2.05	1.8	1.9	2.2	4.4	3.35	3.85	2.55	1.3	1.15
3	1.45	1.5	2.2	1.8	1.95	1.9	4.2	3.4	3.95	2.45	1.3	1.15
4	1.45	1.5	2.5	1.75	1.95	1.85	4.2	3.5	3.9	2.35	1.3	1.3
5	1.45	1.5	2.5	1.75	1.95	1.9	3.95	3.6	3.85	2.3	1.3	1.2
6	1.4	1.5	2.8	1.8	1.95	2.1	3.7	3.7	3.75	2.25	1.3	1.25
7	1.4	1.5	2.75	1.95	2.0	2.35	3.5	3.7	3.7	2.15	1.3	1.25
8	1.4	1.6	2.6	2.1	2.0	2.6	3.3	3.7	3.65	2.1	1.3	1.25
9	1.4	1.65	2.5	2.2	1.95	2.7	3.3	3.6	3.55	2.0	1.3	1.3
10	1.35	1.75	2.45	2.15	2.0	2.9	3.3	3.35	3.5	2.0	1.25	......
11	1.35	1.75	2.35	1.95	2.0	2.9	3.35	3.3	3.4	2.0	1.25	1.35
12	1.35	1.8	2.3	1.8	1.95	2.95	3.3	3.3	3.4	1.95	1.25	1.3
13	1.35	1.8	2.2	1.8	1.9	2.95	3.25	3.3	3.4	1.9	1.25	1.3
14	1.35	1.75	2.1	1.9	1.9	3.15	3.15	3.35	3.4	1.85	1.2	1.35
15	1.35	1.75	2.05	1.9	2.0	3.35	3.0	3.3	3.4	1.8	1.2	1.35
16	1.35	1.65	2.0	1.85	1.95	3.55	2.9	3.7	3.3	1.7	1.2	1.35
17	1.35	1.65	1.9	1.85	1.9	3.7	2.95	4.0	3.25	1.7	1.2	1.35
18	1.35	1.65	1.95	1.85	1.85	3.9	2.95	4.3	3.1	1.7	......	1.35
19	1.4	1.65	1.95	1.9	1.9	3.9	3.0	4.4	2.9	1.6	1.2	1.35
20	1.4	1.8	2.0	1.9	1.9	3.9	2.95	4.5	2.8	1.6	1.15	1.3
21	1.45	1.9	1.95	1.9	2.0	4.0	2.95	4.4	2.7	1.55	1.15	1.3
22	1.45	1.95	1.9	1.85	1.85	4.4	3.0	4.4	2.7	1.55	1.15	1.35
23	1.5	2.0	1.9	2.3	1.9	4.4	3.15	4.3	2.65	1.4	1.1	1.35
24	1.5	2.1	1.9	2.0	1.9	4.4	3.3	4.2	2.6	1.35	1.1	1.35
25	1.5	2.0	1.9	1.9	1.9	4.5	3.45	4.2	2.6	1.35	1.15	1.35
26	1.5	1.95	1.9	1.85	1.9	4.4	3.6	4.1	2.6	1.35	1.15	1.4
27	1.5	1.9	1.9	1.85	1.85	4.2	3.7	4.0	2.5	1.3	1.15	1.4
28	1.5	1.9	1.9	1.85	1.9	3.85	3.7	3.9	2.55	1.3	1.15	1.4
29	1.5	1.95	1.9	1.85	......	3.9	3.6	3.9	2.6	1.3	1.15	1.4
30	1.5	1.95	1.85	1.85	......	3.9	3.5	3.85	2.6	1.3	1.15	1.4
31	1.5	......	1.8	2.0	......	4.0	......	3.85	......	1.3	1.15	......

NOTE.—Gage heights affected by ice Jan. 7 to 11, 23, 24, and 31; Feb. 1, 15; and 21, and Mar. 2, 1911.

Daily discharge, in second-feet, of Grande Ronde River at Elgin, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	39	52	185	120	145	167	2,580	1,040	1,630	455	30	20
2	46	52	202	120	150	158	2,580	1,040	1,700	428	30	20
3	46	52	260	120	167	150	2,250	1,090	1,860	375	30	20
4	46	52	400	106	167	135	2,250	1,210	1,780	328	30	30
5	46	52	400	106	167	150	1,860	1,340	1,700	305	30	23
6	39	52	575	120	167	220	1,480	1,480	1,560	282	30	26
7	39	52	545	120	185	328	1,210	1,480	1,480	240	30	26
8	39	68	455	120	185	455	980	1,480	1,410	220	30	26
9	39	80	400	120	167	515	980	1,340	1,280	185	30	30
10	34	106	375	120	185	640	980	1,040	1,210	185	26	32
11	34	106	328	120	185	640	1,040	980	1,090	185	26	34
12	34	120	305	120	167	675	980	980	1,090	167	26	30
13	34	120	260	120	150	675	930	980	1,090	150	26	30
14	34	106	220	150	150	835	835	1,040	1,090	135	23	34
15	34	106	202	150	158	1,040	710	980	1,090	120	23	34
16	34	80	185	135	167	1,280	640	1,480	980	92	23	34
17	34	80	150	135	150	1,480	675	1,930	930	92	23	34
18	34	80	167	135	135	1,780	675	2,410	790	92	23	34
19	39	80	167	150	150	1,780	710	2,580	640	68	23	34
20	39	120	185	150	150	1,780	675	2,750	575	68	20	30
21	46	150	167	150	142	1,930	675	2,580	515	60	20	30
22	46	167	150	135	135	2,580	710	2,580	515	60	20	34
23	52	185	150	140	150	2,580	835	2,410	485	39	17	34
24	52	220	150	145	150	2,580	980	2,250	455	34	17	34
25	52	185	150	150	150	2,750	1,150	2,250	455	34	20	34
26	52	167	150	135	150	2,580	1,340	2,090	455	34	20	39
27	52	150	150	135	135	2,250	1,480	1,930	400	30	20	39
28	52	150	150	135	150	1,700	1,480	1,780	428	30	20	39
29	52	167	150	135	......	1,780	1,340	1,780	455	30	20	39
30	52	167	135	135	......	1,780	1,210	1,700	455	30	20	39
31	52	......	120	140	......	1,930	......	1,700	......	30	20	......

NOTE.—Discharge determined from a rating curve fairly well defined between 20 and 4,000 second-feet. Discharge interpolated for days when gage heights were affected by ice.

Monthly discharge of Grande Ronde River at Elgin, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	52	34	42.7	2,630	B.
November	220	52	111	6,600	B.
December	575	120	245	15,100	B.
January	150	106	131	8,060	B.
February	185	135	157	8,720	B.
March	2,750	135	1,270	78,100	B.
April	2,580	640	1,210	72,000	B.
May	2,750	980	1,670	103,000	B.
June	1,860	400	986	58,700	B.
July	455	30	148	9,100	B.
August	30	17	24.1	1,480	B.
September	39	20	31.4	1,870	B.
The year	2,750	17	504	365,000	

GRANDE RONDE RIVER AT ZINDEL, WASH.

Location.—At Zindel Ferry, 1½ miles below Joseph Creek and 2 miles above the mouth.

Records available.—June 30, 1904, to September 30, 1911.

Drainage area.—3,950 square miles.

Gage.—Inclined staff on left bank.

Channel.—Rocks and gravel; practically permanent.

Discharge measurements.—Made from a boat near the gage.

Winter flow.—Not seriously affected by ice.

Diversions.—A considerable amount of diversion above the station for irrigation.

Accuracy.—Results good.

Cooperation.—Gage-height record furnished by the Lewiston-Clarkston Development Co.

The following discharge measurement was made by Charles Leidl:

September 27, 1911: Gage height, 2.20 feet; discharge, 715 second-feet.

Daily gage height, in feet, of Grande Ronde River at Zindel, Wash., for the year ending Sept. 30, 1911.

[M. W. Zindel, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.1	2.2	3.2	2.9	2.8	3.5	5.0	4.9	5.0	3.9	2.8	2.0
2	2.1	2.2	3.2	2.9	2.8	3.6	5.0	4.9	5.0	3.9	2.7	2.0
3	2.2	2.2	4.0	2.9	2.8	3.8	5.3	5.0	5.6	3.9	2.5	2.1
4	2.2	2.2	4.0	2.7	2.8	3.8	4.9	5.0	5.4	3.7	2.3	2.1
5	2.9	2.2	3.8	2.7	2.8	3.8	4.6	5.0	5.2	3.7	2.5	2.1
6	2.8	2.5	4.1	2.9	2.8	3.8	4.3	4.9	5.0	3.6	2.6	2.1
7	2.6	3.0	4.0	2.9	2.8	3.9	4.0	4.9	5.1	3.5	2.4	2.1
8	2.4	3.2	3.8	3.1	2.8	4.1	3.8	4.8	5.0	3.5	2.3	2.1
9	2.4	3.2	3.8	3.1	2.7	4.1	3.6	5.0	5.0	3.5	2.3	2.1
10	2.3	3.1	3.6	3.0	2.7	4.1	3.4	5.3	5.0	3.4	2.3	2.1
11	2.3	3.1	3.4	3.0	2.7	4.2	3.2	5.3	5.0	3.4	2.3	2.1
12	2.3	3.1	3.4	3.0	2.7	4.6	3.0	5.3	5.6	3.4	2.3	2.1
13	2.2	3.2	3.4	3.0	2.7	4.6	3.0	5.0	5.6	3.3	2.3	2.1
14	2.2	3.2	3.4	2.8	2.7	4.8	3.0	4.6	5.5	3.3	2.2	2.1
15	2.2	3.2	3.4	2.6	2.5	4.8	3.2	4.0	5.5	3.3	2.2	2.1
16	2.2	3.2	3.4	2.6	2.5	4.8	3.2	4.3	5.3	3.3	2.2	2.1
17	2.2	3.5	3.4	2.6	2.6	5.0	3.5	4.9	5.2	3.3	2.1	2.0
18	2.3	3.5	3.2	2.8	2.6	5.0	3.8	5.1	5.1	3.2	2.1	2.0
19	2.3	3.6	3.1	2.8	2.8	5.0	4.0	5.8	5.0	3.2	2.1	2.0
20	2.3	3.6	3.0	2.8	3.0	5.0	4.2	5.9	5.0	3.2	2.1	2.0
21	2.3	3.8	3.0	2.7	3.0	5.2	4.3	5.5	5.0	3.2	2.1	2.0
22	2.4	4.0	3.0	2.7	3.0	5.3	4.3	5.3	5.0	3.2	2.1	2.0
23	2.4	4.0	2.9	2.6	3.2	5.6	4.5	5.3	4.9	3.2	2.1	2.0
24	2.4	4.0	2.9	2.6	3.3	5.4	4.5	5.0	4.8	3.2	2.1	2.0
25	2.3	3.6	2.9	2.6	3.3	5.0	4.7	4.9	4.3	3.1	2.1	2.0
26	2.3	3.4	2.9	2.7	3.3	4.8	4.8	4.7	4.3	3.1	2.1	2.1
27	2.2	3.4	2.9	2.7	3.8	4.8	5.3	4.6	4.1	3.1	2.0	2.1
28	2.2	3.1	2.8	2.7	3.3	4.7	5.1	4.6	4.0	3.1	2.0	2.2
29	2.2	3.2	2.9	2.7	......	4.6	5.0	4.8	3.9	3.1	2.0	2.2
30	2.2	3.2	2.9	2.8	......	4.6	4.9	4.8	3.9	3.1	2.0	2.2
31	2.2	......	2.9	2.8	......	5.0	......	4.9	......	3.0	2.0	......

Daily discharge, in second-feet, of Grande Ronde River at Zindel, Wash., for 1904–1911.

Day.	June.	July.	Aug.	Sept.	Day.	June.	July.	Aug.	Sept.
1904.									
1	....	5,850	1,450	900	16	....	3,160	1,000	720
2	....	5,850	1,390	852	17	....	2,950	1,000	720
3	....	4,780	1,330	852	18	....	2,950	1,000	720
4	....	4,920	1,270	805	19	....	2,760	1,000	720
5	....	4,780	1,220	805	20	....	2,410	1,000	720
6	....	4,630	1,220	796	21	....	2,330	900	720
7	....	4,630	1,220	788	22	....	2,410	900	720
8	....	4,500	1,160	762	23	....	2,330	852	720
9	....	4,230	1,160	746	24	....	2,250	805	720
10	....	1,100	1,100	728	25	....	2,250	805	720
11	....	3,850	1,100	720	26	....	2,100	805	852
12	....	3,730	1,100	720	27	....	1,900	805	900
13	....	3,610	1,050	720	28	....	1,960	805	806
14	....	3,270	1,050	720	29	3,900	1,960	950	806
15	....	2,950	1,000	720	30	3,560	1,700	1,000	805
					31	....	1,580	1,000	....

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1904–5.												
1	805	805	805	750	1,220	2,100	3,160	3,160	5,220	1,960	720	565
2	805	805	762	750	1,160	2,250	2,950	3,160	5,850	1,960	720	565
3	805	805	762	750	1,100	2,410	2,950	3,380	5,530	1,960	720	565
4	762	805	680	750	900	2,670	2,950	3,380	6,180	1,960	720	565
5	720	762	680	750	1,000	2,670	3,160	3,380	5,850	1,960	720	565
6	762	762	680	750	1,000	2,410	3,160	4,100	5,220	1,960	720	565
7	805	762	762	805	1,000	2,410	3,380	4,100	4,920	1,830	640	565
8	805	762	805	805	950	2,410	3,610	4,100	4,630	1,700	565	565
9	852	762	900	762	900	2,410	3,610	4,360	6,180	1,580	565	565
10	852	762	805	762	805	2,250	3,610	4,630	5,850	1,580	565	565
11	852	762	762	720	805	2,100	3,160	5,220	5,220	1,580	565	530
12	852	805	762	720	762	1,960	2,950	5,220	5,220	1,450	565	530
13	900	805	805	720	720	2,100	2,760	4,920	3,160	1,220	565	565
14	950	762	805	762	720	2,100	2,580	4,360	3,160	1,220	565	565
15	1,100	762	852	762	720	2,100	2,580	3,850	2,950	1,100	565	565
16	1,000	762	900	762	720	2,250	2,580	3,610	2,950	1,000	565	566
17	1,000	762	852	805	762	2,580	2,580	4,500	2,760	1,000	565	565
18	1,000	762	852	805	805	2,760	2,760	4,360	2,760	1,000	565	565
19	950	762	852	900	805	2,580	2,950	4,100	2,760	1,000	565	566
20	950	762	805	900	900	2,760	3,380	4,100	2,760	1,000	565	565
21	950	805	805	900	1,510	2,760	3,380	4,100	2,580	805	565	565
22	900	805	900	900	1,450	2,760	3,380	3,610	2,580	805	565	565
23	900	805	1,000	900	1,450	2,950	3,610	3,610	2,580	805	565	565
24	900	762	950	1,330	1,700	2,950	3,850	3,380	2,950	805	565	565
25	900	762	805	1,830	1,830	3,380	3,850	3,160	2,760	805	565	565
26	852	762	720	1,700	2,040	3,380	4,360	2,950	2,760	720	565	565
27	852	805	720	1,830	2,250	3,850	4,630	3,160	2,410	720	565	640
28	805	805	762	1,700	2,100	3,610	4,630	3,380	2,410	720	565	640
29	805	805	805	1,700	....	3,610	3,610	3,610	2,100	720	565	805
30	805	805	750	1,580	....	3,850	3,380	3,850	2,100	720	565	805
31	805	....	750	1,330	....	3,850	....	4,100	....	720	565	....
1905–6.												
1	805	900	805	720	950	2,250	11,400	6,180	9,600	2,950	720	640
2	805	852	805	720	805	1,960	9,600	6,180	8,770	2,950	720	640
3	805	805	805	720	762	1,960	8,770	5,850	8,370	2,760	720	640
4	762	805	805	805	805	1,960	7,600	6,180	9,180	2,760	720	720
5	720	805	805	805	852	2,250	7,600	5,850	8,770	2,760	720	720
6	762	762	805	805	852	2,250	8,370	5,220	8,770	2,760	720	720
7	805	762	805	805	852	2,250	9,180	4,920	8,770	2,760	720	720
8	805	762	720	805	805	2,250	9,180	4,920	8,370	2,670	720	720
9	805	720	640	805	805	2,950	9,600	4,920	8,370	2,410	720	720
10	805	720	640	805	762	3,610	9,180	5,530	7,600	2,410	720	720
11	805	720	565	805	762	3,380	8,770	6,180	7,600	2,410	720	640
12	805	720	565	805	805	2,950	6,520	5,850	8,370	2,330	720	640
13	852	720	762	852	805	2,580	6,520	5,220	8,370	2,250	900	720
14	852	720	762	852	805	1,830	6,180	4,920	6,520	1,900	720	720
15	852	720	762	720	805	1,830	6,520	4,360	5,530	1,580	720	720

Daily discharge, in second-feet, of Grande Ronde River at Zindel, Wash., for 1904–1911—Continued.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1905–6.												
16	852	720	805	720	1,000	1,830	6,870	3,610	6,520	1,580	720	720
17	852	762	805	762	1,000	1,330	5,850	3,610	5,850	1,580	720	640
18	805	762	805	762	1,330	1,580	6,870	3,160	5,220	1,450	720	640
19	805	762	805	805	2,950	1,450	6,870	3,160	4,630	1,330	720	680
20	805	762	805	805	2,950	1,450	6,870	3,160	4,100	1,220	720	680
21	805	720	805	805	2,330	1,450	7,600	3,160	3,850	1,220	602	680
22	805	720	762	805	2,580	1,700	9,600	3,160	3,610	1,100	565	680
23	805	720	640	900	2,760	1,700	9,600	2,950	3,380	1,050	565	680
24	805	720	640	900	2,760	2,100	9,600	2,950	3,160	1,050	720	680
25	805	762	762	1,000	2,410	5,530	7,980	2,950	2,950	900	720	640
26	900	805	805	1,100	2,180	6,520	7,980	2,760	2,950	900	720	640
27	1,000	1,100	805	1,050	2,580	7,980	7,980	2,760	2,760	900	720	640
28	900	1,100	805	900	2,250	8,370	7,230	2,760	2,760	805	720	640
29	900	900	762	900	....	8,770	5,850	3,380	2,760	805	640	640
30	900	805	762	900	....	8,770	6,180	5,220	2,760	805	640	640
31	900	....	762	900	....	10,000	....	7,980	....	720	640	....
1906–7.												
1	640	852	1,580	4,920	6,020	7,980	5,850	6,180	9,600	3,610	1,830	1,000
2	640	852	1,580	4,100	5,220	7,230	6,870	6,870	9,600	3,610	1,830	1,160
3	640	805	1,580	3,850	4,630	6,520	7,230	6,870	8,770	5,530	1,830	1,100
4	720	805	1,580	5,220	3,850	5,220	7,600	7,230	8,770	6,520	1,450	1,000
5	720	805	1,580	5,850	4,920	5,220	8,370	7,230	6,870	5,850	1,450	1,000
6	720	805	1,450	4,920	16,100	4,920	9,600	8,370	6,520	5,530	1,450	1,000
7	720	1,100	1,450	4,100	13,300	4,920	10,000	8,770	6,180	4,920	1,450	1,000
8	720	2,040	1,580	3,380	11,400	4,920	14,300	8,770	6,180	4,920	1,330	900
9	720	1,960	1,700	2,950	11,400	4,630	14,800	8,770	7,600	4,360	1,220	900
10	720	1,700	1,830	2,580	10,500	4,630	18,500	8,770	8,770	4,100	1,220	900
11	720	1,580	1,830	2,580	10,600	4,630	17,400	10,000	9,600	3,160	1,220	1,000
12	720	1,700	2,100	2,580	8,370	4,360	15,100	9,600	8,370	3,160	1,220	1,000
13	720	2,100	2,100	2,410	7,600	4,360	15,800	8,770	6,870	4,100	1,100	1,000
14	720	13,500	1,700	2,410	7,600	4,230	17,400	8,770	5,220	3,380	1,100	900
15	720	13,500	1,700	2,100	7,600	4,100	17,400	9,180	4,360	3,160	1,100	900
16	762	8,770	1,700	2,100	7,230	4,100	16,400	9,600	4,100	3,160	1,100	900
17	762	6,180	1,580	2,100	7,230	3,610	16,900	9,600	4,100	3,160	1,000	900
18	762	4,360	1,580	2,100	7,230	4,100	15,800	9,600	3,610	2,760	1,000	900
19	762	3,380	1,700	1,960	6,870	7,230	14,300	10,000	3,380	2,760	900	900
20	762	2,950	1,960	1,960	9,180	11,600	13,300	11,400	3,160	2,410	805	900
21	762	2,950	8,180	1,960	9,180	16,600	11,400	10,500	3,610	2,410	805	900
22	762	2,410	7,980	1,900	9,600	13,300	10,900	10,500	3,980	2,410	805	900
23	762	2,250	6,180	1,900	10,000	11,400	10,500	9,600	4,100	2,410	805	900
24	762	1,960	6,180	1,580	10,900	9,600	10,000	9,180	3,380	2,410	1,100	900
25	762	1,960	5,530	1,580	12,300	9,180	9,630	7,980	3,740	2,410	1,000	900
26	762	1,700	8,770	1,580	13,300	8,370	9,600	6,870	4,100	2,250	900	900
27	805	1,700	9,180	1,450	13,800	6,870	8,770	6,870	3,850	2,250	1,000	805
28	950	1,580	8,370	1,580	9,600	5,850	8,370	6,870	5,530	2,250	1,000	805
29	950	1,580	7,230	1,960	....	5,530	7,230	6,870	5,530	2,250	1,000	805
30	900	1,580	6,870	2,250	....	5,850	6,870	7,980	5,220	2,100	900	805
31	900	....	5,850	2,860	....	5,850	....	8,770	....	2,100	900	....
1907–8.												
1	805	950	1,000	1,580	900	1,960	....	7,230	3,380	3,610	900	720
2	805	900	1,000	1,580	900	1,830	....	6,870	3,380	3,610	900	805
3	805	900	1,000	1,450	805	1,700	....	6,870	3,160	4,100	805	805
4	805	900	1,000	1,450	805	1,580	3,610	6,520	2,760	3,850	805	805
5	805	852	1,000	1,220	805	1,580	3,850	6,520	2,760	3,380	805	305
6	805	805	1,000	1,220	1,000	1,450	3,850	6,180	2,950	3,380	805	805
7	805	805	1,000	1,100	1,100	1,450	3,850	6,180	3,160	3,160	720	720
8	762	805	1,000	1,000	1,220	1,330	3,610	5,850	3,160	2,950	720	720
9	762	762	1,100	1,000	1,220	1,330	3,610	5,220	3,160	2,950	720	720
10	720	762	1,220	1,000	1,100	1,450	4,920	4,920	4,630	2,950	720	720
11	720	720	1,330	1,000	1,100	1,580	6,870	4,630	6,180	2,760	720	720
12	720	805	1,330	1,100	1,000	2,410	7,600	4,920	6,520	2,410	720	720
13	720	805	1,330	1,100	1,000	2,950	9,390	5,850	6,700	2,410	640	720
14	720	805	1,270	1,100	1,050	5,850	9,600	5,220	6,870	2,250	640	720
15	720	720	1,220	1,100	1,100	18,500	10,500	4,630	7,230	2,250	640	1,830
16	720	720	1,100	1,050	1,160	....	10,900	4,360	7,980	2,250	640	1,580
17	720	720	1,100	1,000	1,220	....	10,900	3,850	8,370	2,100	565	1,330
18	720	720	1,100	1,000	1,100	....	9,600	3,610	9,600	1,960	565	1,000
19	720	720	1,100	1,000	1,100	....	10,500	3,610	9,600	1,960	565	900
20	720	720	1,100	1,330	1,000	....	13,300	3,610	9,180	1,830	495	900

Daily discharge, in second-feet, of Grand Ronde River at Zindel, Wash., for 1904–1911—Continued.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1907–8.												
21	720	720	1,100	1,700	1,000	....	13,300	3,380	8,370	1,700	495	900
22	720	720	1,100	1,450	1,100	....	12,800	3,380	6,870	1,700	435	900
23	720	805	1,390	1,220	1,100	....	11,800	3,380	5,850	1,700	435	805
24	720	1,000	1,830	1,000	1,100	....	11,400	3,160	5,220	1,580	435	805
25	720	1,330	2,580	900	1,330	....	10,500	3,160	4,100	1,580	435	720
26	720	1,330	4,230	900	1,580	....	8,770	3,380	3,610	1,330	495	720
27	720	1,220	5,850	900	1,960	....	8,370	3,380	3,610	1,330	495	720
28	720	1,160	3,850	1,100	2,040	....	7,600	3,610	3,380	1,220	495	720
29	720	1,100	2,950	1,100	1,960	....	7,230	3,850	3,160	1,220	565	720
30	720	1,000	1,830	1,000	....	....	7,230	3,610	3,160	1,100	640	720
31	805	....	1,830	1,000	....	....	....	3,610	....	1,000	720	....
1908–9.												
1	720	1,220	900	900	1,220	1,700	5,530	5,220	9,600	3,610	1,580	640
2	720	1,220	900	900	1,220	1,960	5,530	5,850	11,800	3,100	1,580	720
3	720	1,220	900	900	1,100	2,250	5,220	6,870	10,900	4,100	1,580	720
4	720	1,100	900	900	1,330	3,160	5,220	8,770	10,000	3,160	1,330	720
5	720	1,100	900	640	1,330	3,160	4,630	7,230	9,600	3,160	1,330	720
6	805	1,100	900	565	1,330	2,950	4,360	6,520	9,600	2,950	1,220	720
7	805	1,100	900	565	1,330	2,950	3,610	6,520	8,770	2,410	1,100	720
8	900	1,000	900	565	1,220	2,950	3,160	6,180	7,600	2,250	1,100	640
9	1,000	1,000	900	565	1,220	2,580	3,160	6,180	7,600	2,100	1,000	640
10	1,000	1,000	900	565	1,220	2,410	3,380	5,850	5,850	2,100	1,000	640
11	1,100	1,000	950	520	1,100	2,250	3,850	5,850	5,850	2,410	900	640
12	1,330	1,000	950	480	1,100	2,250	4,360	5,850	5,220	2,100	900	640
13	1,330	950	950	440	1,100	2,100	4,920	5,220	5,530	2,100	805	640
14	1,580	950	950	400	1,330	2,100	5,220	4,920	5,850	2,100	805	640
15	2,760	900	900	565	2,580	2,250	5,220	4,920	5,850	1,960	805	720
16	2,410	900	900	565	3,610	2,580	5,530	4,920	5,850	1,960	805	720
17	1,700	900	900	3,160	3,160	2,760	5,220	4,630	6,520	1,830	805	720
18	1,580	900	900	2,410	2,760	2,950	4,920	4,630	7,230	1,700	805	762
19	1,580	900	720	2,760	2,760	2,950	4,630	4,630	7,600	1,580	805	762
20	1,450	900	640	3,160	2,580	3,160	4,630	4,360	7,600	1,580	720	720
21	1,450	900	640	4,630	2,580	3,160	4,630	4,360	6,870	1,580	720	720
22	1,330	900	565	4,630	2,250	3,160	4,360	4,100	5,850	1,580	720	640
23	1,100	900	565	3,160	1,960	4,360	4,360	3,850	4,920	1,700	720	640
24	1,000	900	565	2,250	1,960	5,220	4,360	3,850	4,920	1,700	720	640
25	900	1,000	565	1,580	1,830	5,530	4,360	3,610	4,920	2,100	640	640
26	900	1,000	565	1,580	1,830	5,850	4,920	3,610	4,360	2,100	640	565
27	900	1,000	640	1,330	1,700	5,850	5,530	3,610	4,100	3,160	640	565
28	1,000	1,000	640	1,330	1,700	5,530	5,850	4,100	4,100	3,160	640	565
29	1,000	1,000	720	1,330	....	5,530	5,850	4,360	3,610	2,950	640	565
30	1,100	1,000	720	1,330	....	5,530	6,520	5,220	3,610	2,410	640	640
31	1,100	....	900	1,330	....	5,530	....	6,180	....	1,580	640	....
1909–10.												
1	640	900	3,160	565	900	7,230	10,000	6,870	5,530	1,450	640	565
2	640	900	2,950	640	900	24,500	11,800	6,870	5,220	1,450	565	565
3	640	1,100	2,950	640	900	32,900	11,800	6,870	4,360	1,450	565	565
4	640	1,100	2,950	565	805	30,700	12,300	6,520	4,360	1,450	565	565
5	640	1,330	2,580	565	805	21,800	11,400	6,180	5,530	1,330	565	565
6	565	1,330	2,250	565	720	17,400	11,400	5,850	5,530	1,330	565	565
7	565	1,330	1,580	565	720	13,800	10,900	6,180	4,920	1,220	565	565
8	565	1,220	1,580	565	900	12,300	10,500	6,870	4,630	1,220	565	565
9	565	1,220	1,330	565	900	10,000	10,500	7,980	3,850	1,220	565	640
10	565	1,100	1,330	565	1,000	10,000	11,400	12,300	3,380	1,220	565	640
11	565	1,100	1,220	565	1,000	12,800	12,300	13,300	3,160	1,100	565	640
12	565	1,000	1,000	565	1,100	13,300	17,400	11,400	2,950	1,100	565	640
13	640	1,000	1,000	565	1,220	14,800	19,600	10,000	2,950	1,000	565	640
14	640	1,000	1,000	435	1,330	16,400	17,400	9,180	2,950	1,000	565	565
15	640	1,000	1,000	435	1,330	16,400	14,800	7,600	2,760	1,000	565	565
16	640	1,000	1,000	380	1,330	16,400	13,800	7,600	2,760	1,000	565	565
17	720	1,000	805	380	1,220	16,400	11,800	7,230	2,580	1,000	565	565
18	720	1,000	805	380	1,100	20,000	11,800	7,230	2,250	1,000	565	565
19	805	1,580	720	380	1,100	27,900	11,400	7,230	2,250	900	565	565
20	805	2,250	640	380	1,330	30,700	10,500	7,230	2,100	900	565	640
21	805	2,410	640	380	1,330	33,500	9,600	6,870	2,100	900	565	640
22	805	2,100	640	435	1,330	30,700	9,600	6,870	2,100	900	565	720
23	805	2,100	565	565	1,450	27,300	8,770	6,870	2,100	900	565	720
24	900	2,760	565	720	1,450	24,000	8,570	6,180	1,960	900	565	720
25	900	3,160	565	805	1,450	19,100	8,370	6,180	1,960	805	565	720

Daily discharge, in second-feet, of Grand Ronde River at Zindel, Wash., for 1904–1911—Continued.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1909–10.												
26	900	6,520	565	805	1,830	15,300	7,600	5,850	1,960	805	565	720
27	900	9,600	565	805	2,250	13,300	7,600	5,220	1,960	720	565	720
28	900	6,870	565	805	2,950	12,300	6,870	4,920	1,960	720	565	720
29	900	5,850	565	1,000	....	12,300	6,870	4,920	1,580	720	565	720
30	900	3,850	565	1,000	....	11,400	6,870	4,920	1,450	720	565	640
31	900	....	565	1,000	....	10,000	....	5,530	....	720	565	....
1910–11.												
1	640	720	1,830	1,450	1,330	2,250	5,850	5,530	5,850	2,950	1,330	565
2	640	720	1,830	1,450	1,330	2,410	5,850	5,530	5,850	2,950	1,220	565
3	720	720	3,160	1,450	1,330	2,760	6,870	5,850	7,980	2,950	1,000	640
4	720	720	3,160	1,220	1,330	2,760	5,530	5,850	7,230	2,580	805	640
5	1,450	720	2,760	1,220	1,330	2,760	4,630	5,850	6,520	2,580	1,000	640
6	1,330	1,000	3,380	1,450	1,330	2,760	3,850	5,530	5,850	2,410	1,100	640
7	1,100	1,580	3,160	1,450	1,330	2,950	3,160	5,530	6,180	2,250	900	640
8	900	1,830	2,760	1,700	1,330	3,380	2,760	5,220	5,850	2,250	805	640
9	900	1,830	2,760	1,700	1,220	3,380	2,410	5,850	5,850	2,250	805	640
10	805	1,700	2,410	1,580	1,220	3,380	2,100	6,870	5,850	2,100	805	640
11	805	1,700	2,100	1,580	1,220	3,610	1,830	6,870	5,850	2,100	805	640
12	805	1,700	2,100	1,580	1,220	4,630	1,580	6,870	7,980	2,100	805	640
13	720	1,830	2,100	1,580	1,220	4,630	1,580	5,850	7,980	1,960	805	640
14	720	1,830	2,100	1,330	1,220	5,220	1,580	4,630	7,600	1,960	720	640
15	720	1,830	2,100	1,100	1,000	5,220	1,830	3,160	7,600	1,960	720	640
16	720	1,830	2,100	1,100	1,000	5,220	1,830	3,850	6,870	1,960	720	640
17	720	2,250	2,100	1,100	1,100	5,850	2,250	5,530	6,520	1,960	640	565
18	805	2,250	1,830	1,330	1,100	5,850	2,760	6,180	6,180	1,830	640	565
19	805	2,410	1,700	1,330	1,330	5,850	3,160	8,770	5,850	1,830	640	565
20	805	2,410	1,580	1,330	1,580	5,850	3,610	9,180	5,850	1,830	640	565
21	805	2,760	1,580	1,220	1,580	6,520	3,850	7,600	5,850	1,830	640	565
22	900	3,160	1,580	1,220	1,580	6,870	3,850	6,870	5,850	1,830	640	565
23	900	3,160	1,450	1,100	1,830	7,980	4,360	6,870	5,530	1,830	640	565
24	900	3,160	1,450	1,100	1,960	7,230	4,360	5,850	5,220	1,830	640	565
25	805	2,410	1,450	1,100	1,960	5,850	4,920	5,530	3,850	1,700	640	565
26	805	2,100	1,450	1,220	1,960	5,220	5,220	4,920	3,850	1,700	640	640
27	720	2,100	1,450	1,220	1,960	5,220	6,870	4,630	3,380	1,700	565	640
28	720	1,700	1,330	1,220	1,960	4,920	6,180	4,630	3,160	1,700	565	720
29	720	1,830	1,450	1,220	....	4,630	5,850	5,220	2,950	1,700	565	720
30	720	1,830	1,450	1,330	....	4,630	5,530	5,220	2,950	1,700	565	720
31	720	....	1,450	1,330	....	5,850	....	5,530	....	1,580	565	....

NOTE.—Discharge June 30, 1904, to Sept. 30, 1911, determined from a rating curve fairly well defined below 10,000 second-feet. Discharge estimated because of ice effect Dec. 30, 1904, to Jan. 6, 1905, and Dec. 17 to 21, 1907. Discharge estimated for Jan. 11 to 14, 1909, as it is believed gage could not be read accurately.

Monthly discharge of Grande Ronde River at Zindel, Wash., for 1904–1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1904.					
July	5,850	1,580	3,310	204,000	A.
August	1,450	805	1,050	64,600	A.
September	900	720	767	45,600	A.
The period	....	....	....	314,000	
1904–5.					
October	1,100	720	871	53,600	A.
November	805	762	781	46,500	A.
December	1,000	680	802	49,300	B.
January	1,830	720	1,010	62,100	B.
February	2,250	720	1,150	63,900	B.
March	3,850	1,960	2,720	167,000	B.
April	4,630	2,580	3,320	198,000	B.
May	5,220	2,950	3,900	240,000	B.
June	6,180	2,100	3,810	227,000	B.
July	1,960	720	1,240	76,200	B.
August	720	565	597	36,700	B.
September	805	530	584	34,800	B.
The year	6,180	530	1,730	1,260,000	

Monthly discharge of Grande Ronde River at Zindel, Wash., for 1904–1911—Continued.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Minimum.	Maximum.	Mean.		
1905–6.					
October	1,000	720	829	51,000	B.
November	1,100	720	787	46,800	B.
December	805	565	754	46,400	B.
January	1,100	720	834	51,300	B.
February	2,950	762	1,480	82,200	B.
March	10,000	1,330	3,440	212,000	B.
April	11,400	5,850	7,930	472,000	B.
May	7,980	2,760	4,480	275,000	B.
June	9,600	2,760	6,010	358,000	B.
July	2,950	720	1,780	109,000	B.
August	900	565	704	43,300	B.
September	720	640	677	40,300	B.
The year	11,400	565	2,470	1,790,000	
1906–7.					
October	950	640	756	46,500	B.
November	13,500	805	2,980	177,000	B.
December	9,180	1,450	3,680	226,000	B.
January	5,850	1,450	2,730	168,000	B.
February	16,100	3,850	9,100	505,000	B.
March	16,600	3,610	6,670	410,000	B.
April	18,500	5,850	11,900	708,000	B.
May	11,400	6,180	8,590	528,000	B.
June	9,600	3,160	5,820	346,000	B.
July	6,520	2,100	3,400	209,000	B.
August	1,830	805	1,160	71,300	B.
September	1,160	805	929	55,300	B.
The year	18,500	640	4,770	3,450,000	
1907–8.					
October	805	720	745	45,800	B.
November	1,330	720	876	52,100	B.
December	5,850	1,000	1,640	101,000	B.
January	1,700	900	1,150	70,700	B.
February	2,040	805	1,170	67,300	B.
March 1–13	18,500	1,330	3,130	93,100	B.
April 4–30	13,300	3,610	8,350	447,000	B.
May	7,230	3,160	4,660	287,000	B.
June	9,600	2,760	5,270	314,000	B.
July	4,100	1,000	2,310	142,000	B.
August	900	435	637	39,200	B.
September	1,830	720	859	51,100	B.
1908–9.					
October	2,760	720	1,180	72,600	B.
November	1,220	900	999	59,400	B.
December	950	565	801	49,300	B.
January	4,630	400	1,480	91,000	C.
February	3,610	1,100	1,800	100,000	B.
March	5,850	1,700	3,440	212,000	B.
April	6,520	3,160	4,770	284,000	B.
May	8,770	3,610	5,220	321,000	B.
June	11,800	3,610	6,720	400,000	B.
July	4,100	1,580	2,360	145,000	B.
August	1,580	640	914	56,200	B.
September	762	565	667	39,700	B.
The year	11,800	400	2,540	1,830,000	
1909–1910.					
October	900	565	722	44,400	B.
November	9,600	900	2,290	136,000	B.
December	3,160	565	1,230	75,600	B.
January	1,000	380	600	36,900	B.
February	2,950	720	1,240	68,900	B.
March	33,500	7,230	18,500	1,140,000	C.
April	19,600	6,870	11,100	660,000	B.
May	13,300	4,920	7,250	446,000	A.
June	5,530	1,450	3,100	184,000	A.
July	1,450	720	1,040	64,000	A.
August	640	565	567	34,900	A.
September	720	565	626	37,200	A.
The year	33,500	380	4,040	2,930,000	

Monthly discharge of Grande Ronde River at Zindel, Wash., for 1904–1911—Continued.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Minimum.	Maximum.	Mean.		
1910–11.					
October	1,450	640	824	50,700	A.
November	3,160	720	1,860	111,000	A.
December	3,380	1,330	2,040	125,000	A.
January	1,700	1,100	1,330	81,800	B.
February	1,960	1,000	1,420	78,900	A.
March	7,980	2,250	4,700	289,000	A.
April	6,870	1,580	3,870	230,000	A.
May	9,180	3,160	5,850	360,000	A.
June	7,980	2,950	5,800	345,000	A.
July	2,950	1,580	2,060	127,000	A.
August	1,330	565	760	46,700	A.
September	720	565	620	36,900	A.
The year	9,180	565	2,600	1,880,000	

CATHERINE CREEK NEAR UNION, OREG.

Location.—On the ranch of S. T. Godsey, 8 miles southeast of Union.

Records available.—July 20 to September 30, 1911.

Drainage area.—96 square miles.

Gage.—Vertical staff on left bank.

Channel.—Gravel, shifting slightly at low stages.

Discharge measurements.—Made by wading.

Winter flow.—Seriously affected by ice.

Diversions.—Above all diversions except one ditch, which irrigates about 10 acres.

Accuracy.—Results fair.

Cooperation.—Gage-height record furnished by the city of Union.

Estimates withheld for additional data.

The following discharge measurement was made by R. W. Davenport:

July 20, 1911: Gage height, 0.50 feet; discharge, 47.3 second-feet.

Daily gage height, in feet, of Catharine Creek near Union, Oreg., for the year ending Sept. 30, 1911.

Day.	Aug.	Sept.	Day.	Aug.	Sept.	Day.	Aug.	Sept.
1	0.4	0.3	11	0.35	0.3	21	0.35	0.3
2	.4	.3	12	.35	.3	22	.35	.3
3	.45	.3	13	.35	.3	23	.35	.3
4	.45	.3	14	.35	.3	24	.35	.3
5	.4	.35	15	.35	.3	25	.3	.3
6	.4	.4	16	.35	.3	26	.3	.3
7	.4	.4	17	.35	.3	27	.3	.3
8	.4	.35	18	.35	.3	28	.3	.3
9	.4	.35	19	.35	.3	29	.3	.3
10	.35	.3	20	.35	.3	30	.3	.3
						31	.3	....

WALLOWA RIVER NEAR JOSEPH, OREG.

Location.—In sec. 5, T. 3 S., R. 45 E., about 300 feet below the controlling dam at the outlet of Wallowa Lake, and 50 feet above footbridge; about half a mile above Joseph. Above the headgates of four irrigation ditches, the first taking out 125 feet below gage.

Records available.—November 12, 1903, to September 30, 1911.

Drainage area.—52 square miles (revised).

Gage.—Vertical staff bolted to a large bowlder on right bank.

Channel.—Bed composed of bowlders; will not shift; banks seldom overflow; current swift and velocities uneven across section.

Discharge measurements.—Made from footbridge or by wading at low water.

Winter flow.—Unaffected by ice on account of proximity to lake outlet.

Artificial control.—About 10,000 acre-feet of storage developed in Wallowa Lake; additional development possible.

Accuracy.—Results good; high-water measurements somewhat impaired by poor measuring conditions.

No discharge measurements were made during the year.

Daily gage height, in feet, of Wallowa River near Joseph, Oreg., for the year ending Sept. 30, 1911.

[John Martin, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.0	2.1	2.3	2.30	2.05	2.00	2.00	2.35	2.80	3.10	2.90	2.20
2	2.0	2.1	2.3	2.30	2.05	2.00	2.10	2.35	2.80	3.10	2.90	2.20
3	2.0	2.1	2.3	2.30	2.05	2.00	2.10	2.35	2.80	3.10	2.80	2.20
4	2.0	2.1	2.3	2.30	2.05	2.00	2.10	2.35	2.80	3.10	2.80	2.20
5	2.0	2.1	2.3	2.30	2.00	2.00	2.10	2.35	2.80	3.10	2.80	2.20
6	2.0	2.2	2.3	2.30	2.00	2.00	2.10	2.35	2.80	3.00	2.75	2.20
7	2.0	2.2	2.3	2.30	2.00	2.00	2.10	2.40	2.80	3.00	2.75	2.20
8	2.0	2.2	2.3	2.20	2.00	2.00	2.10	2.40	2.80	3.00	2.70	2.20
9	2.1	2.2	2.3	2.20	2.00	2.00	2.20	2.40	2.80	2.90	2.70	2.20
10	2.1	2.2	2.3	2.20	2.00	2.00	2.20	2.40	2.80	2.90	2.65	2.15
11	2.1	2.2	2.3	2.20	2.00	2.00	2.20	2.40	3.10	2.90	2.60	2.15
12	2.1	2.2	2.3	2.20	2.00	2.00	2.20	2.40	3.10	2.90	2.60	2.15
13	2.1	2.2	2.3	2.20	2.00	2.00	2.20	2.40	3.10	2.90	2.55	2.15
14	2.1	2.2	2.3	2.20	2.00	2.00	2.20	2.50	3.10	2.90	2.55	2.15
15	2.1	2.2	2.3	2.15	2.00	2.00	2.20	2.50	3.10	2.90	2.50	2.15
16	2.1	2.2	2.3	2.15	2.00	2.00	2.20	2.50	3.10	3.00	2.50	2.15
17	2.1	2.2	2.3	2.15	2.00	2.00	2.20	2.50	3.10	3.00	2.50	2.10
18	2.1	2.2	2.3	2.15	2.00	2.00	2.20	2.50	3.20	3.00	2.45	2.10
19	2.1	2.2	2.3	2.15	2.00	2.00	2.20	2.50	3.20	3.00	2.45	2.10
20	2.1	2.2	2.3	2.15	2.00	2.00	2.20	2.50	3.40	3.00	2.40	2.10
21	2.1	2.2	2.3	2.15	2.00	2.00	2.20	2.50	3.40	3.00	2.40	2.10
22	2.1	2.2	2.3	2.10	2.00	2.00	2.20	2.50	3.40	3.00	2.40	2.10
23	2.1	2.2	2.3	2.10	2.00	2.00	2.25	2.50	3.40	3.00	2.35	2.10
24	2.1	2.2	2.3	2.10	2.00	2.00	2.25	2.50	3.40	3.00	2.35	2.10
25	2.1	2.2	2.3	2.10	2.00	2.00	2.25	2.50	3.30	3.00	2.35	2.10
26	2.1	2.2	2.3	2.10	2.00	2.00	2.25	2.50	3.30	3.00	2.35	2.10
27	2.1	2.3	2.3	2.10	2.00	2.00	2.30	2.50	3.30	3.00	2.30	2.10
28	2.1	2.3	2.3	2.10	2.00	2.00	2.30	2.50	3.20	3.00	2.30	2.10
29	2.1	2.3	2.3	2.05	....	2.00	2.30	2.50	3.20	3.00	2.25	2.10
30	2.1	2.3	2.3	2.05	....	2.00	2.35	2.50	3.10	3.00	2.25	2.10
31	2.1	....	2.3	2.05	....	2.00	....	2.50	....	3.00	2.25	....

Daily discharge, in second-feet, of Wallowa River near Joseph, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	60	80	135	133	70	59	59	149	326	495	377	105
2	60	80	135	133	70	59	80	149	326	495	377	105
3	60	80	135	133	70	59	80	149	326	495	326	105
4	60	80	135	133	70	59	80	149	326	495	326	105
5	60	80	135	133	59	59	80	149	326	495	326	105
6	60	105	135	133	59	59	80	149	326	433	303	105
7	60	105	135	133	59	59	80	165	326	433	303	105
8	60	105	135	105	59	59	80	165	326	433	280	105
9	80	105	135	105	59	59	105	165	326	377	280	105
10	80	105	135	105	59	59	105	165	326	377	259	92
11	80	105	135	105	59	59	105	165	495	377	238	92
12	80	105	135	105	59	59	105	165	495	377	238	92
13	80	105	135	105	59	59	105	165	495	377	219	92
14	80	105	135	105	59	59	105	200	495	377	219	92
15	80	105	135	92	59	59	105	200	495	377	200	92
16	80	105	135	92	59	59	105	200	495	433	200	92
17	80	105	135	92	59	59	105	200	495	433	200	80
18	80	105	135	92	59	59	105	200	561	433	182	80
19	80	105	135	92	59	59	105	200	561	433	182	80
20	80	105	135	92	59	59	105	200	702	433	165	80
21	80	105	135	92	59	59	105	200	702	433	165	80
22	80	105	135	80	59	59	105	200	702	433	165	80
23	80	105	135	80	59	59	119	200	702	433	149	80
24	80	105	135	80	59	59	119	200	702	433	149	80
25	80	105	135	80	59	59	119	200	630	433	149	80
26	80	105	135	80	59	59	119	200	630	433	149	80
27	80	135	135	80	59	59	133	200	630	433	133	80
28	80	135	135	80	59	59	133	200	561	433	133	80
29	80	135	135	70	....	59	133	200	561	433	119	80
30	80	135	135	70	....	59	149	200	495	433	119	80
31	80	....	135	70	....	59	....	200	....	433	119	....

NOTE.—Discharge determined from a rating curve fairly well defined between 60 and 500 second-feet.

Monthly discharge of Wallowa River near Joseph, Oreg., for the year ending Sept. 30, 1911.

[Drainage area, 52 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	80	60	74.8	1.44	1.66	4,600	B.
November	135	80	105	2.02	2.25	6,250	B.
December	135	135	135	2.60	3.00	8,300	B.
January	133	70	99.4	1.91	2.20	6,110	B.
February	70	59	60.6	1.17	1.22	3,370	B.
March	59	59	59.0	1.13	1.30	3,630	B.
April	149	59	104	2.00	2.23	6,190	B.
May	200	149	182	3.50	4.04	11,200	B.
June	702	326	495	9.52	10.62	29,500	B.
July	495	377	430	8.27	9.53	26,400	B.
August	377	119	218	4.19	4.83	13,400	B.
September	105	80	90.3	1.74	1.94	5,370	B.
The year	702	59	172	3.31	44.82	124,000	

WALLOWA RIVER AT MINAM, OREG.

Location.—In sec. 29, T. 2 N., R. 41 E., 1,000 feet below the new county highway bridge at Minam and about the same distance below the mouth of Minam River; 12 miles from Elgin and 9 miles below Wallowa Valley.

Records available.—November 18, 1903, to September 28, 1907; November 16, 1908, to September 30, 1911.

Drainage area.—570 square miles.

Gage.—Two sections on left bank at site of old highway bridge, which collapsed in October, 1905.

Channel.—Clean gravel; practically permanent. Banks will not overflow; one channel at all stages.

Discharge measurements.—Made from highway bridge.

Winter flow.—Materially affected by ice and ice jams during severe winter weather.

Diversions.—Many ditches divert from Wallowa River and its western tributaries for irrigation in the Wallowa Valley, above the station.

Accuracy.—Results are good, except during ice periods and extreme high water; no measurements have been made at extreme high stages.

No discharge measurements were made during the year.

Daily gage height, in feet, of Wallowa River near Minam, Oreg., for the year ending Sept. 30, 1911.

[A. M. Boswell, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.4	2.5	2.9	2.55	2.10	2.30	3.40	3.55	4.2	3.80	2.60	2.30
2	2.45	2.55	2.9	2.50	2.10	2.30	3.40	3.70	4.9	3.70	2.60	2.30
3	2.5	2.55	2.9	2.60	2.10	2.40	3.40	3.90	5.0	3.70	2.60	2.30
4	2.8	2.55	3.3	2.60	2.10	2.40	3.45	3.80	5.0	3.70	2.70	2.30
5	2.6	2.5	3.1	2.50	2.10	2.60	3.20	4.2	4.8	3.80	2.60	2.40
6	2.5	2.5	3.0	2.50	2.10	2.60	3.10	4.2	4.6	3.80	2.60	2.50
7	2.5	2.5	2.9	2.60	2.10	2.70	3.10	3.90	4.8	3.90	2.60	2.50
8	2.5	2.7	3.0	2.60	2.10	2.70	3.00	3.85	4.7	3.70	2.60	2.50
9	2.5	2.8	3.0	2.60	2.20	2.60	3.00	3.70	4.6	3.60	2.50	2.45
10	2.56	2.7	2.9	2.55	2.10	2.70	3.00	3.60	4.5	3.50	2.50	2.40
11	2.5	2.9	2.8	2.50	2.10	2.70	3.00	3.45	5.0	3.40	2.50	2.40
12	2.5	3.0	2.8	2.30	2.10	2.80	3.10	3.50	5.3	3.30	2.50	2.40
13	2.5	2.9	2.8	2.40	2.10	2.80	2.90	3.50	5.5	3.30	2.40	2.40
14	2.5	2.9	2.8	2.40	2.10	2.80	2.95	3.45	5.5	3.30	2.40	2.40
15	2.5	2.7	2.8	2.40	2.10	3.00	2.90	3.45	5.3	3.30	2.40	2.40
16	2.5	2.7	2.8	2.40	2.10	3.10	2.90	4.0	5.2	3.30	2.40	2.40
17	2.5	2.7	2.7	2.40	2.10	3.20	2.90	4.2	5.0	3.25	2.40	2.40
18	2.5	2.7	2.7	3.30	2.10	3.30	3.00	4.1	5.0	3.20	2.40	2.45
19	2.6	2.65	2.65	2.60	2.20	3.35	3.00	4.1	4.9	3.10	2.40	2.40
20	2.6	2.65	2.7	2.40	2.20	3.35	2.90	4.0	4.8	3.00	2.40	2.40
21	2.6	2.8	2.75	2.40	2.10	3.35	2.90	3.95	5.2	3.00	2.40	2.40
22	2.6	3.3	2.6	2.40	2.10	3.40	3.00	3.90	5.0	2.90	2.40	2.40
23	2.5	3.35	2.6	2.40	2.20	3.45	3.10	3.90	4.7	2.90	2.40	2.40
24	2.5	3.1	2.65	2.40	2.20	3.40	3.20	3.85	4.4	2.80	2.40	2.40
25	2.5	3.1	2.6	2.40	2.20	3.30	3.70	3.70	4.3	2.80	2.35	2.40
26	2.5	3.0	2.55	2.40	2.20	3.20	3.80	3.60	4.1	2.70	2.35	2.40
27	2.5	2.9	2.6	2.40	2.20	3.20	3.90	3.50	4.2	2.70	2.30	2.40
28	2.5	2.9	2.6	2.50	2.20	3.20	3.70	3.50	4.3	2.70	2.30	2.40
29	2.5	2.85	2.6	2.40	....	3.20	3.50	3.50	4.1	2.70	2.30	2.40
30	2.5	2.8	2.65	2.50	....	3.20	3.50	3.65	4.0	2.65	2.30	2.40
31	2.5	....	2.5	2.55	....	3.30	....	4.0	....	2.60	2.30	....

NOTE.—Some ice in river during January and February. Gage heights Jan. 13 to 31 probably seriously affected.

Daily discharge, in second-feet, of Wallowa River near Minam, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	352	415	748	450	209	295	1,340	1,540	2,560	1,900	485	295
2	384	450	748	415	209	295	1,340	1,760	3,900	1,760	485	295
3	415	450	748	485	209	352	1,340	2,060	4,100	1,760	485	295
4	652	450	1,210	485	209	352	1,400	1,900	4,100	1,760	564	295
5	485	415	964	415	209	485	1,080	2,560	3,700	1,900	485	352
6	415	415	852	415	209	485	964	2,560	3,300	1,900	485	415
7	415	415	748	485	209	564	964	2,060	3,700	2,060	485	415
8	415	564	852	485	209	564	852	1,980	3,500	1,760	485	415
9	415	652	852	485	248	485	852	1,760	3,300	1,610	415	384
10	415	564	748	450	209	564	852	1,610	3,100	1,470	415	352
11	415	748	652	415	209	564	852	1,400	4,100	1,340	415	352
12	415	852	652	295	209	652	964	1,470	4,730	1,210	415	352
13	415	748	652	....	209	652	748	1,470	5,150	1,210	352	352
14	415	748	652	....	209	652	800	1,400	5,150	1,210	352	352
15	415	564	652	....	209	852	748	1,400	4,730	1,210	352	352
16	415	564	652	....	209	964	748	2,220	4,520	1,210	352	352
17	415	564	564	....	209	1,080	748	2,560	4,100	1,140	352	352
18	415	564	564	....	209	1,210	852	2,380	4,100	1,080	352	384
19	485	524	524	....	248	1,270	852	2,380	3,900	964	352	352
20	485	524	564	....	248	1,270	748	2,220	3,700	852	352	352
21	485	652	608	....	209	1,270	748	2,140	4,520	852	352	352
22	485	1,210	485	....	209	1,340	852	2,060	4,100	748	352	352
23	415	1,270	485	....	248	1,400	964	2,060	3,500	748	352	352
24	415	964	524	....	248	1,340	1,080	1,980	2,910	652	352	352
25	415	964	485	....	248	1,210	1,760	1,760	2,730	652	324	352
26	415	852	450	....	248	1,080	1,900	1,610	2,380	564	324	352
27	415	748	485	....	248	1,080	2,060	1,470	2,560	564	295	352
28	415	748	485	....	248	1,080	1,760	1,470	2,730	564	295	352
29	415	700	485	....	....	1,080	1,470	1,470	2,380	564	295	352
30	415	652	524	....	....	1,080	1,470	1,680	2,220	524	295	352
31	415	....	415	....	....	1,210	....	2,220	....	485	295	....

NOTE.—Discharge determined from a rating curve well defined between 300 and 2,500 second-feet. Discharge Jan. 13 to 31 estimated at 250 second-feet.

Monthly discharge of Wallowa River at Minam, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	652	352	431	26,500	A.
November	1,270	415	665	39,600	A.
December	1,210	415	646	39,700	A.
January	485	....	324	19,900	C.
February	248	209	222	12,300	B.
March	1,400	295	864	53,100	A.
April	2,060	748	1,100	65,500	A.
May	2,560	1,400	1,890	116,000	A.
June	5,150	2,220	3,650	217,000	B.
July	2,060	485	1,170	71,900	A.
August	564	295	386	23,700	A.
September	415	295	353	21,000	A.
The year	....	....	976	706,000	

ASOTIN CREEK NEAR ASOTIN, WASH.

Location.—450 feet above intake of Lewiston-Clarkston Improvement Co.'s power plant, in the SE. ¼ sec. 20, T. 10 N., R. 45 E., and one-fourth mile below station formerly maintained at Shellman's ranch.

Records available.—March 25, 1904, to November 30, 1906; low-water periods of 1910 and 1911.

Drainage area.—171 square miles.

Gage.—Vertical staff reading head on weir.

Channel.—10-foot, standard, sharp-crested weir with end contractions; practically no velocity of approach.

Accuracy.—Records probably good.

Cooperation.—Records kept and furnished by the Lewiston-Clarkston Improvement Co.

Daily gage height, in feet, and discharge, in second-feet, of Asotin Creek near Asotin, Wash., for 1910–11.

Day.	1910				1911							
	August.		September.		July.		August.		September.		October.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	......	......	0.97	31.0	......	......	0.90	28.3	......	29.5	0.94	30.2
2	......	......	.95	30.1	......	......	.91	28.7	0.92	29.0	1.14	40.0
3	......	......	.97	31.0	......	......	.92	29.0	.92	29.0	1.02	33.8
4	......	......	......	30.6	......	......	.94	30.4	.92	29.0	.98	31.8
5	......	......	.95	30.1	......	......	.96	30.9	1.06	36.3	.99	32.6
6	......	......	.95	30.1	......	......	.96	30.9	1.05	35.6	.98	32.4
7	......	......	.99	32.0	......	......	.94	30.1	1.02	34.4	......	......
8	......	......	.95	30.1	......	......	.92	29.5	1.00	32.8	......	......
9	......	......	.93	29.1	......	......	.92	29.2	.96	31.1	......	......
10	......	......	.93	29.1	......	......	.91	28.7	.96	31.1	......	......
11	......	......	.93	29.1	......	......	.90	28.0	.96	31.3	......	......
12	......	......	.93	29.1	......	......	.90	28.0	.94	30.0	......	......
13	......	......	.93	29.1	......	......	.88	27.6	......	29.5	......	......
14	......	......	.91	28.2	......	......	.88	27.6	.92	29.0	......	......
15	0.86	26.0	.91	28.2	......	......	.90	28.3	.94	30.0	......	......
16	.86	25.8	.95	30.1	......	......	.90	28.3	.95	30.6	......	......
17	.90	28.0	1.02	34.0	......	......	.89	27.8	.96	31.3	......	......
18	.85	25.5	.97	31.0	......	......	.90	28.0	.96	31.1	......	......
19	.85	25.5	.97	31.0	......	......	.89	27.8	.94	29.9	......	......
20	.83	24.6	.93	29.1	......	......	.90	28.0	.94	29.9	......	......
21	.83	24.6	1.06	34.6	......	......	.92	29.0	.93	29.7	......	......
22	.85	25.5	1.03	34.6	......	......	.92	29.0	.92	29.4	......	......
23	.90	27.9	......	......	......	......	.92	29.0	.91	28.7	......	......
24	.89	27.3	......	......	0.90	28.6	.89	27.8	.92	29.0	......	......
25	.89	27.3	......	......	.90	28.1	.88	27.4	.92	29.4	......	......
26	.92	28.5	......	......	.88	27.6	.88	27.6	.93	29.7	......	......
27	.94	29.4	......	......	.88	27.6	.91	28.7	.96	31.4	......	......
28	.91	28.2	......	......	......	26.5	.91	28.7	.96	31.4	......	......
29	.90	27.8	......	......	.84	25.4	.90	28.3	.94	30.1	......	......
30	.93	29.1	......	......	.86	26.2	.91	28.7	.94	29.9	......	......
31	.91	28.2	......	......	.88	27.1	.94	30.0	......	......	......	......

NOTE.—Discharge determined from weir formula.

Monthly discharge of Asotin Creek near Asotin, Wash., for 1910–11.

Month.	Discharge in second-feet.			Total in acre-feet.
	Maximum.	Minimum.	Mean.	
1910.				
August 15–31	29.4	24.6	27.0	910
September 1–22	34.6	28.2	30.5	1,330
1911.				
July 24–31	28.6	25.4	27.1	430
August	30.9	27.4	28.7	1,760
September	36.3	28.7	30.6	1,820
October 1–6	40.0	30.2	33.5	399

SELWA RIVER NEAR LOWELL, IDAHO.

Location.—At the Goddard Bar ranger station, in sec. 23, T. 32 N., R. 7 E., 2 miles below mouth of O'Hara Creek and 4 miles above Lowell and the junction with Locksa River.

Records available.—April 11 to September 2, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on left bank.

Channel.—Gravel and rock; practically permanent.

Discharge measurements.—By wading or from a cable.

Winter flow.—Affected by ice.

Diversions.—None.

Accuracy.—Records good.

Cooperation.—Field data furnished by the United States Forest Service.

Discharge measurements of Selwa River near Lowell, Idaho, in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Mar. 18	J. P. Martin	2.95	2,500
June 2[a]	F. C. Ebert	7.00	13,500
July 25	E. W. Kramer	2.20	1,830
Oct. 30	J. C. Beebe	1.48	900

[a] Surface velocities observed and coefficient of 0.85 used to reduce to mean velocity.

Daily gage height, in feet, and discharge, in second-feet, of Selwa River near Lowell, Idaho, for 1911.

Day.	April.		May.		June.		July.		August.		September.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1				8,500	6.5	11,900	4.6	6,620	1.8	1,270	1.3	735
2				9,000	7.0	13,500	4.6	6,620	2.0	1,520	1.3	735
3				10,000	7.0	13,500	4.5	6,370	2.0	1,520		
4				11,500	7.2	14,200	4.4	6,120	1.9	1,390		
5			7.2	14,200	6.4	11,600	4.3	5,880	2.0	1,520		
6			6.9	13,200	6.3	11,300	4.2	5,640	2.0	1,520		
7			6.3	11,300	6.4	11,600	4.0	5,170	2.0	1,520		
8			5.8	9,820	7.2	14,200	3.8	4,710	1.9	1,390		
9			5.3	8,430	6.6	12,200	3.6	4,260	1.8	1,270		
10			5.2	8,160	6.7	12,500	3.4	3,830	1.8	1,270		
11	3.6	4,260	5.2	8,160	6.8	12,800	3.2	3,440	1.7	1,150		
12	3.5	4,040	5.2	8,160	7.4	14,800	3.0	3,070	1.7	1,150		
13	3.4	3,830	5.3	8,430	7.6	15,600	3.0	3,070	1.6	1,040		
14	3.3	3,630	5.2	8,160	7.5	15,200	3.0	3,070	1.5	930		
15	3.2	3,440	5.2	8,160	6.9	13,200	3.0	3,070	1.5	930		
16	3.3	3,630	5.3	8,980	6.6	12,200	2.8	2,720	1.5	930		
17	3.4	3,830	5.8	9,820		11,700	2.7	2,550	1.5	930		
18		3,830	5.5	8,980		11,200	2.6	2,390	1.5	930		
19	3.4	3,830	5.5	8,980		10,700	2.5	2,230	1.5	930		
20	3.5	4,040	5.4	8,700		10,200	2.4	2,080	1.5	930		
21	3.9	4,940	5.4	8,700		9,660	2.5	2,230	1.4	830		
22	4.0	5,170	5.4	8,700		9,160	2.4	2,080	1.4	830		
23	4.4	6,120	5.4	8,700		8,650	2.3	1,930	1.4	830		
24	5.0	7,640	5.4	8,700		8,150	2.2	1,790	1.4	830		
25	5.5	8,960	4.8	7,120	5.0	7,640	2.2	1,790	1.4	830		
26	6.0	10,400	4.7	6,870	4.8	7,120	2.0	1,520	1.4	830		
27	6.2	11,000	4.7	6,870	4.5	6,370	2.0	1,520	1.4	830		
28	5.8	9,820	4.8	7,120	4.8	7,120	2.0	1,520	1.4	830		
29	5.5	8,980	4.8	7,120	4.7	6,870	2.0	1,520	1.3	735		
30		8,500	5.0	7,640	4.8	7,120	1.9	1,390	1.3	735		
31			5.3	8,430			1.9	1,390	1.3	735		

NOTE.—Discharge determined from a rating curve well defined between 600 and 2,500 second-feet and fairly well defined between 2,500 and 20,000 second-feet. Estimated Apr. 30 to May 4 by comparison with Locksa River. Interpolated June 17 to 24.

Monthly discharge of Selwa River near Lowell, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April 11-30	11,000	3,440	6,000	238,000	B.
May	14,200	6,870	8,920	548,000	B.
June	15,600	6,370	11,100	660,000	B.
July	6,620	1,390	3,280	202,000	B.
August	1,520	735	1,060	65,200	A.
The period				1,710,000	

CLEARWATER RIVER AT KAMIAH, IDAHO.

Location.—At the toll bridge at Kamiah, in sec. 1, T. 33 N., R. 3 E. Boise meridian, about 6 miles below mouth of South Fork.

Records available.—August 21, 1910, to September 30, 1911.

Drainage area.—4,850 square miles.

Gage.—Chain gage installed May 30, 1911. Previous to that date a gage painted on lower steel caisson of first pier from left abutment was used. Datum of the chain gage is 0.06 foot higher than that of old gage.

Channel.—Gravel; rather rough; two channels for stages between 5 and 8 feet.

Discharge measurements.—Made from the bridge.

Winter flow.—Not affected by ice.

Accuracy.—Rating curve well defined; results probably excellent.

Discharge measurements of Clearwater River at Kamiah, Idaho, in 1910–11.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Aug. 20	Allen and Davenport	2.22	1,160	May 30	F. C. Ebert	8.18	18,900
Nov. 6	F. C. Ebert	3.42	2,850	June 4	.....do	11.12	37,500
				July 27	E. W. Kramer	3.90	3,620

NOTE.—Gage heights of above measurements refer to datum of chain gage installed May 30, 1911. Surface velocities were observed on May 30 and June 4 and coefficient of 0.85 used to reduce to mean velocity.

Daily gage height, in feet, and discharge, in second-feet, of Clearwater River at Kamiah, Idaho, for 1910.

[J. W. Maguire, observer.]

Day.	August.		September.		Day.	August.		September.	
	Gage height.	Discharge.	Gage height.	Discharge.		Gage height.	Discharge.	Gage height.	Discharge.
1			2.7	1,660	16			2.45	1,380
2			2.95	1,980	17			2.65	1,600
3			2.75	1,720	18			2.85	1,840
4			2.45	1,380	19			2.75	1,720
5			2.45	1,380	20	2.25	1,180	2.65	1,600
6			2.45	1,380	21	2.25	1,180	2.9	1,910
7			2.45	1,380	22	2.15	1,080	2.95	1,980
8			2.45	1,380	23	2.15	1,080	3.05	2,120
9			2.4	1,320	24	2.15	1,080	2.8	1,780
10			2.4	1,320	25	2.15	1,080		1,580
11			2.4	1,320	26	2.15	1,080	2.45	1,380
12			2.35	1,280	27	2.2	1,130	2.45	1,380
13			2.3	1,220	28	2.2	1,130	2.45	1,380
14			2.25	1,180	29	2.35	1,280	2.4	1,320
15			2.25	1,180	30	2.75	1,720	2.4	1,320
					31	2.5	1,430		

Daily gage height, in feet, of Clearwater River at Kamiah, Idaho, for the year ending Sept. 30, 1911.

[J. W. Maguire, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.45	3.5	4.15	3.2	3.8	2.6	6.6	8.4	10.0	8.2	3.6	2.6
2	2.85	3.7	4.2	3.0	3.8	2.8	7.2	8.6	10.5	7.8	3.6	2.6
3	3.0	3.8	4.3	2.8	3.6	3.0	6.8	9.0	10.5	7.4	3.8	2.6
4	5.2	3.8	5.0	3.0	3.4	3.0	6.4	9.6	11.0	7.1	3.7	2.7
5	4.7	3.65	4.95	3.6	3.4	3.2	6.4	10.0	10.0	7.0	3.8	3.1
6	3.85	3.45	4.75	3.6	3.4	3.2	5.7	10.8	9.4	6.7	3.7	3.8
7	3.75	3.6	4.35	3.4	3.3	3.6	5.6	10.0	10.0	6.4	3.8	4.0
8	3.9	4.65	4.6	3.5	3.3	3.4	5.4	10.0	10.6	6.2	3.8	3.4
9	3.75	5.05	4.25	3.4	3.2	3.6	5.8	9.8	10.2	6.0	3.5	3.1
10	3.65	4.6	4.15	3.4	3.2	3.8	5.9	9.4	9.8	5.8	3.4	3.0
11	3.5	5.95	3.95	3.4	3.3	3.6	5.8	8.8	10.4	5.6	3.3	2.9
12	3.2	6.2	4.05	3.4	3.3	3.7	5.8	9.0	11.0	5.4	3.2	2.8
13	3.15	5.75	3.9	3.2	3.2	3.7	5.6	8.8	11.1	5.4	3.2	2.7
14	3.85	5.35	3.75	3.2	3.2	3.8	5.5	8.6	10.8	5.2	3.1	2.7
15	3.75	4.9	3.5	3.2	3.2	4.1	5.4	8.8	10.4	5.2	3.1	2.7
16	3.4	4.8	3.35	3.2	3.2	4.2	5.4	9.6	9.8	5.0	3.1	2.9
17	3.3	4.3	3.6	3.2	3.2	4.4	5.4	10.0	9.4	4.8	3.0	3.0
18	3.8	4.55	3.85	3.2	3.0	4.8	5.6	9.6	8.9	4.8	3.0	2.9
19	4.2	4.65	3.75	3.4	3.1	5.0	5.8	9.6	8.8	4.6	3.0	2.9
20	3.75	4.55	3.45	3.4	3.0	5.2	5.7	9.4	8.6	4.6	2.9	2.8
21	3.6	4.95	3.35	3.3	2.8	5.6	6.1	9.0	8.3	4.4	2.8	2.7
22	3.4	5.9	3.65	3.2	2.8	5.8	6.5	8.6	8.3	4.3	2.8	2.6
23	3.3	5.5	3.65	3.2	2.9	6.1	7.2	9.0	8.0	4.2	2.8	2.6
24	3.2	5.35	3.6	3.2	2.8	6.4	7.8	9.0	8.4	4.2	2.8	2.7
25	3.15	5.05	3.45	3.2	2.8	6.2	8.8	9.1	7.8	4.1	2.8	2.6
26	3.65	4.6	3.55	3.2	3.0	5.7	9.4	8.8	7.2	4.0	2.7	2.6
27	3.9	4.35	3.75	3.2	2.8	5.4	9.6	9.0	7.0	3.9	2.7	2.6
28	3.5	4.15	3.75	3.2	2.8	5.2	9.2	8.6	7.9	3.8	2.7	2.6
29	3.35	4.45	3.45	3.2	....	5.2	8.8	8.2	7.8	3.8	2.6	2.7
30	3.15	4.35	3.35	3.2	....	5.3	8.4	8.2	8.0	3.7	2.6	2.6
31	3.25	....	3.45	3.6	....	6.0	....	8.8	....	3.6	2.6	....

NOTE.—Gage heights Aug. 21, 1910, to May 29, 1911, observed on the caisson gage, have been reduced to datum of the chain gage installed May 30, 1911.

Daily discharge, in second-feet, of Clearwater River at Kamiah, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1,380	2,860	4,170	2,350	3,430	1,540	11,700	20,000	29,400	19,000	3,040	1,540
2	1,840	3,230	4,280	2,050	3,430	1,780	14,300	21,100	32,600	17,000	3,040	1,540
3	2,050	3,430	4,510	1,780	3,040	2,050	12,500	23,400	32,600	15,200	3,430	1,540
4	6,870	3,430	6,310	2,050	2,680	2,050	10,900	26,900	35,900	13,800	3,230	1,660
5	5,510	3,140	6,180	3,040	2,680	2,350	10,900	29,400	29,400	13,400	3,430	2,200
6	3,530	2,770	5,640	3,040	2,680	2,350	8,390	34,600	25,700	12,100	3,230	3,430
7	3,330	3,040	4,630	2,680	2,510	3,040	8,070	29,400	29,400	10,900	3,430	3,840
8	3,630	5,380	5,250	2,860	2,510	2,680	7,460	29,400	33,200	10,100	3,430	2,680
9	3,330	6,450	4,400	2,680	2,350	3,040	8,720	28,200	30,700	9,410	2,860	2,200
10	3,140	5,250	4,170	2,680	2,350	3,430	9,060	25,700	28,200	8,720	2,680	2,050
11	2,860	9,240	3,740	2,680	2,510	3,040	8,720	22,200	31,900	8,070	2,510	1,910
12	2,350	10,100	3,950	2,680	2,510	3,230	8,720	23,400	35,900	7,460	2,350	1,780
13	2,280	8,560	3,630	2,350	2,350	3,230	8,070	22,200	36,600	7,460	2,350	1,660
14	3,530	7,310	3,330	2,350	2,350	3,430	7,760	21,100	34,600	6,870	2,200	1,660
15	3,230	6,040	2,860	2,350	2,350	4,060	7,460	22,200	31,900	6,870	2,200	1,660
16	2,680	5,770	2,600	2,350	2,350	4,280	7,460	26,900	28,200	6,310	2,200	1,910
17	2,510	4,510	3,040	2,350	2,350	4,750	7,460	29,400	25,700	5,770	2,050	2,050
18	3,430	5,120	3,530	2,350	2,050	5,770	8,070	26,900	22,800	5,770	2,050	1,910
19	4,280	5,380	3,330	2,680	2,200	6,310	8,720	26,900	22,200	5,250	2,050	1,910
20	3,330	5,120	2,770	2,680	2,050	6,870	8,390	25,700	21,100	5,250	1,910	1,780
21	3,040	6,180	2,600	2,510	1,780	8,070	9,770	23,400	19,500	4,750	1,780	1,660
22	2,680	9,060	3,140	2,350	1,780	8,720	11,300	21,100	19,500	4,510	1,780	1,540
23	2,510	7,760	3,140	2,350	1,910	9,770	14,300	23,400	18,000	4,280	1,780	1,540
24	2,350	7,310	3,040	2,350	1,780	10,900	17,000	23,400	20,000	4,280	1,780	1,660
25	2,280	6,450	2,770	2,350	1,780	10,100	22,200	24,000	17,000	4,060	1,780	1,540
26	3,140	5,250	2,950	2,350	2,050	8,390	25,700	22,200	14,300	3,840	1,660	1,540
27	3,630	4,630	3,330	2,350	1,780	7,460	26,900	23,400	13,400	3,630	1,660	1,540
28	2,860	4,170	3,330	2,350	1,780	6,870	24,600	21,100	17,500	3,430	1,660	1,540
29	2,600	4,880	2,770	2,350	....	6,870	22,200	19,000	17,000	3,430	1,540	1,660
30	2,280	4,630	2,600	2,350	....	7,160	20,000	19,000	18,000	3,230	1,540	1,540
31	2,430	....	2,770	3,040	....	9,410	....	22,200	....	3,040	1,540	....

NOTE.—Discharge determined from a well-defined rating curve.

Monthly discharge of Clearwater River at Kamiah, Idaho, for 1910–11.

[Drainage area, 4,850 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
1910.							
August 20-31	1,720	1,080	1,200	0.247	0.11	28,600	A.
September	2,120	1,180	1,510	.311	.35	89,800	A.
1910-11.							
October	6,870	1,380	3,060	.631	.73	188,000	A.
November	10,100	2,770	5,550	1.14	1.27	330,000	A.
December	6,310	2,600	3,700	.763	.88	228,000	A.
January	3,040	1,780	2,480	.511	.59	152,000	A.
February	3,430	1,780	2,330	.480	.50	129,000	A.
March	10,900	1,540	5,260	1.08	1.24	323,000	A.
April	26,900	7,460	12,600	2.60	2.90	750,000	A.
May	34,600	19,000	24,400	5.03	5.80	1,500,000	A.
June	36,600	13,400	25,700	5.30	5.91	1,530,000	A.
July	19,000	3,040	7,650	1.58	1.82	470,000	A.
August	3,430	1,540	2,330	.480	.55	143,000	B.
September	3,840	1,540	1,890	.390	.44	112,000	B.
The year	36,600	1,380	8,100	1.67	22.63	5,860,000	

CLEARWATER RIVER NEAR LEWISTON, IDAHO.

Location.—At Central Ferry, about 3 miles above Lewiston, about 4 miles above mouth of the river, and below all important tributaries and diversions.

Records available.—August 23, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff in three sections attached to posts on right bank near ferry.

Channel.—Heavy gravel; practically permanent.

Discharge measurements.—Made from a boat attached to the ferry cable, or from a gaging car on the upper ferry cable.

Accuracy.—Rating curve well defined; accuracy reduced somewhat by uncertainties concerning stability of gage sections.

Discharge measurements of Clearwater River near Lewiston, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Aug. 22	Allen and Davenport	1.00	2,300	May 25	F. C. Ebert	9.01	36,400
Nov. 4	F. C. Ebert	3.08	6,200	June 6	.....do	10.04	44,900
				July 14	Charles Leidl	4.36	10,400
1911.				Sept. 28	.....do	1.86	3,390
Apr. 23	Henshaw and Ebert	7.24	24,400				

NOTE.—Surface velocities were observed on May 25 and June 6 and a coefficient of 0.84 used to reduce to mean velocity.

Daily gage height, in feet, and discharge, in second-feet, of Clearwater River near Lewiston, Idaho, for the year ending Sept. 30, 1910.

[Virgil Hirtzler, observer.]

Day.	August.		September.		Day.	August.		September.	
	Gage height.	Discharge.	Gage height.	Discharge.		Gage height.	Discharge.	Gage height.	Discharge.
1			1.4	2,720	16			1.1	2,390
2			1.5	2,840	17			1.2	2,490
3			1.9	3,450	18			1.4	2,720
4			1.7	3,120	19			1.6	2,970
5			1.6	2,970	20			1.5	2,840
6			1.5	2,840	21			1.4	2,720
7			1.4	2,720	22			1.6	2,970
8			1.3	2,600	23	1.0	2,300	1.8	3,280
9			1.3	2,600	24	.9	2,210	1.9	3,450
10			1.2	2,490	25	.9	2,210	1.5	2,840
11			1.2	2,490	26	1.0	2,300	1.3	2,600
12			1.1	2,390	27	1.1	2,390	1.2	2,490
13			1.1	2,390	28	1.1	2,390	1.2	2,090
14			1.1	2,390	29	1.1	2,390	1.1	2,390
15			1.1	2,390	30	1.1	2,390	1.1	2,390
					31	1.5	2,840		

Daily gage height, in feet, of Clearwater River near Lewiston, Idaho, for the year ending Sept. 30, 1911.

[Virgil Hirtzler, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.1	2.3	3.6	2.8	3.3	1.6	6.7	8.0	9.5	8.1	2.8	1.6
2	1.2	2.7	3.7	1.8	3.4	1.6	7.4	8.4	10.8	7.4	2.7	1.7
3	2.2	2.7	3.7	1.6	3.1	1.6	7.7	9.4	11.1	7.1	2.9	1.7
4	3.0	3.1	4.2	1.8	2.8	1.7	7.3	10.2	10.9	6.6	2.8	1.7
5	4.0	2.9	5.2	2.9	2.9	2.1	6.8	10.7	11.1	6.3	3.1	1.7
6	3.0	2.7	4.7	3.1	2.8	2.1	6.2	11.7	10.0	6.0	3.0	2.3
7	2.7	2.6	4.3	3.1	3.0	2.2	5.8	11.7	9.9	5.2	2.7	3.3
8	2.6	3.2	4.2	3.0	2.9	2.7	5.4	10.5	10.6	5.4	2.9	2.9
9	2.6	5.3	4.1	3.1	2.7	3.2	5.5	10.1	11.1	5.4	2.8	2.4
10	2.5	4.5	4.0	3.0	2.7	3.4	5.9	9.8	10.1	5.3	2.7	2.2
11	2.4	5.6	3.8	3.0	2.7	3.4	6.2	9.1	10.1	4.9	2.5	2.1
12	2.2	6.8	3.6	2.9	2.7	3.5	6.1	8.6	10.9	4.7	2.3	2.1
13	2.1	6.0	3.6	2.7	2.7	3.5	5.9	8.8	11.1	4.5	2.3	2.0
14	2.0	5.2	3.5	2.7	2.6	3.7	5.4	8.8	11.1	4.4	2.3	1.9
15	2.5	4.6	3.4	2.4	2.7	3.8	5.1	8.7	10.6	4.4	2.2	1.9
16	2.3	4.3	3.0	2.2	2.4	4.3	5.1	9.1	10.0	4.3	2.2	1.8
17	2.2	4.0	3.0	2.0	2.3	4.4	5.1	11.2	9.4	4.0	2.0	2.3
18	2.1	3.8	3.2	2.0	2.2	5.2	5.3	10.7	8.9	3.7	2.1	2.2
99	3.3	3.8	3.2	2.2	2.2	5.5	5.7	10.9	8.3	3.8	2.1	2.2
20	3.1	3.6	3.0	2.3	2.3	5.7	5.6	10.3	8.1	3.7	2.0	2.1
21	2.7	4.0	2.6	2.4	2.3	6.0	5.6	9.6	8.0	3.6	2.0	1.9
22	2.3	7.5	2.8	2.2	2.0	6.4	6.6	9.2	7.8	3.5	1.9	2.0
23	2.1	6.2	2.9	2.0	2.0	6.7	6.9	9.1	7.6	3.3	1.9	2.0
24	2.0	5.7	3.0	1.8	2.0	7.0	7.9	9.1	7.3	3.3	1.9	2.0
25	2.0	5.1	3.2	1.8	2.0	6.8	9.0	9.0	7.0	3.2	1.9	1.9
26	2.1	4.8	3.0	2.0	2.1	6.2	9.7	8.8	6.9	3.1	1.8	1.8
27	2.8	4.2	3.0	1.9	2.0	5.7	9.9	8.7	6.6	3.1	1.7	1.9
28	2.9	4.0	2.9	1.8	1.9	5.4	9.8	8.5	7.1	2.9	1.8	1.9
29	2.3	4.0	2.8	1.8		5.1	9.2	8.2	7.4	2.9	1.8	1.9
30	2.2	3.8	2.8	1.9		5.2	8.7	8.2	7.3	2.8	1.7	1.9
31	2.2		2.7	2.0		5.7		8.5		2.7	1.7	

NOTE.—Gage heights for 1910 above stage of 2.5 feet differ from those published in United States Geol. Survey Water-Supply Paper 292 on account of corrections due to errors in gage.

Daily discharge, in second-feet, of Clearwater River near Lewiston, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2,390	4,230	7,810	5,410	6,850	2,970	21,200	29,100	40,300	29,800	5,410	2,970
2	2,490	5,150	8,140	3,280	7,160	2,970	25,300	31,800	51,400	25,300	5,150	3,120
3	4,020	5,150	8,140	2,970	6,250	2,970	27,200	39,400	54,100	23,500	5,680	3,120
4	5,960	6,250	9,890	3,280	5,410	3,120	24,700	46,100	52,300	20,700	5,410	3,120
5	9,180	5,680	13,900	5,680	5,680	3,820	21,800	50,500	54,100	19,100	6,250	3,120
6	5,960	5,150	11,800	6,250	5,410	3,820	18,600	59,600	44,400	17,600	5,960	4,230
7	5,150	4,900	10,200	6,250	5,960	4,020	16,800	59,600	43,600	13,900	5,150	6,850
8	4,900	6,550	9,890	5,960	5,680	5,150	14,800	48,700	49,600	14,800	5,680	5,680
9	4,900	14,300	9,530	6,250	5,150	6,550	15,200	45,200	54,100	14,800	5,410	4,450
10	4,670	11,000	9,180	5,960	5,150	7,160	17,100	42,700	45,200	14,300	5,150	4,020
11	4,450	15,700	8,480	5,960	5,150	7,160	18,600	37,100	45,200	12,600	4,670	3,820
12	4,020	21,800	7,810	5,680	5,150	7,480	18,100	33,300	52,300	11,800	4,230	3,820
13	3,820	17,600	7,810	5,150	5,150	7,480	17,100	34,800	54,100	11,000	4,230	3,630
14	3,630	13,900	7,480	5,150	4,900	8,140	14,800	34,800	54,100	10,600	4,230	3,450
15	4,670	11,400	7,160	4,450	5,150	8,480	13,400	34,000	49,600	10,600	4,020	3,450
16	4,230	10,200	5,960	4,020	4,450	10,200	13,400	37,100	44,400	10,200	4,020	3,280
17	4,020	9,180	5,960	3,630	4,230	10,600	13,400	55,000	39,400	9,180	3,630	4,230
18	3,820	8,480	6,550	3,630	4,020	13,900	14,300	50,500	35,500	8,140	3,820	4,020
19	6,850	8,480	6,550	4,020	4,020	15,200	16,200	52,300	31,100	8,480	3,820	4,020
20	6,250	7,810	5,960	4,230	4,230	16,200	15,700	47,000	29,800	8,140	3,630	3,820
21	5,150	9,180	4,900	4,450	4,230	17,600	15,700	41,100	29,100	7,810	3,630	3,450
22	4,230	25,900	5,410	4,020	3,630	19,600	20,700	37,900	27,800	7,480	3,450	3,630
23	3,820	18,600	5,680	3,630	3,630	21,200	22,300	37,100	26,500	6,850	3,450	3,630
24	3,630	16,200	5,960	3,280	3,630	22,900	28,400	37,100	24,700	6,850	3,450	3,630
25	3,630	13,400	6,550	3,280	3,630	21,800	36,300	36,300	22,900	6,550	3,450	3,450
26	3,820	12,200	5,960	3,630	3,820	18,600	41,900	34,800	22,300	6,250	3,280	3,280
27	5,410	9,890	5,960	3,450	3,630	16,200	43,600	34,000	20,700	6,250	3,120	3,450
28	5,680	9,180	5,680	3,280	3,450	14,800	42,700	32,600	23,500	5,680	3,280	3,450
29	4,230	9,180	5,410	3,280	....	13,400	37,900	30,400	25,300	5,680	3,280	3,450
30	4,020	8,480	5,410	3,450	....	13,900	34,000	30,400	24,700	5,410	3,120	3,450
31	4,020	....	5,150	3,630	....	16,200	....	32,600	....	5,150	3,120	....

NOTE.—Discharge determined from a rating curve which is well defined.

Monthly discharge of Clearwater River near Lewiston, Idaho, for the year ending Sept. 30, 1910–11.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1910.					
August 23–31	2,840	2,210	2,380	42,500	A.
September	3,450	2,390	2,710	161,000	A.
1911.					
October	9,180	2,390	4,610	283,000	A.
November	25,900	4,230	10,800	643,000	A.
December	13,900	4,900	7,430	457,000	A.
January	6,250	2,970	4,410	271,000	A.
February	7,160	3,450	4,810	267,000	A.
March	22,900	2,970	11,100	682,000	A.
April	43,600	13,400	22,700	1,350,000	A.
May	59,600	29,100	40,400	2,480,000	A.
June	54,100	20,700	39,100	2,330,000	A.
July	29,800	5,150	11,800	726,000	A.
August	6,250	3,120	4,260	262,000	B.
September	6,850	2,970	3,770	224,000	B.
The year	59,600	2,390	13,800	9,980,000	

LOCHSA RIVER[1] NEAR LOWELL, IDAHO.

Location.—In sec. 33, T. 33 N., R. 7 E., one-fourth mile above Pete King Bar ranger station, 1 mile above the post office at Lowell and 2 miles above junction with the Selway River.

Records available.—November 8, 1910, to September 30, 1911.

Drainage area.—1,170 square miles.

Gage.—Inclined staff on right bank.

Channel.—Rocky; practically permanent.

Discharge measurements.—Made by wading or from cable 1 mile below the gage.

Winter flow.—Seriously affected by ice.

Accuracy.—Results good.

Discharge measurements of Lochsa River near Lowell, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Nov. 8	Kramer and Ebert	3.36	2,920	June 2	F. C. Ebert	6.85	11,000
1911.				July 25	E. W. Kramer	2.47	1,450
Mar. 15	J. P. Martin	2.25	1,070				

Daily gage height, in feet, of Lochsa River near Lowell, Idaho, for the year ending Sept. 30, 1911.

Day.	Nov.	Dec.	Jan.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1			2.0		3.8	5.1	6.8			1.6
2			1.8		4.1	5.3	7.2			1.6
3		2.83	1.8		4.0	5.8	7.2			1.55
4			2.15		3.8	6.1	7.4	4.2		1.7
5			2.3			6.8	6.5	4.0	2.3	2.1
6			2.3			7.4	6.1	3.8	2.3	2.4
7			2.3			6.2	6.5	3.8	2.4	2.25
8	3.36		2.4			5.8	7.1	3.6		2.05
9	3.18					5.8	6.6	3.6		2.0
10	3.45		1.15		3.5	5.6	6.2	3.4		1.85
11	3.97		1.15		3.5	5.2	6.9	3.3		1.8
12	3.82				3.4	5.4	7.4	3.2		1.8
13	3.44				3.2	5.5	8.1		1.9	1.75
14	3.23			2.1	3.1	5.2			1.9	1.7
15	3.05			2.25		5.4		3.0	1.9	1.7
16	2.85			2.4		6.0		3.0	1.9	
17	2.75			2.5		6.2		2.9	1.85	
18	2.82	2.42		2.65		5.9		2.8	1.85	1.9
19	2.75	2.22		2.75	3.4	5.8		2.75	1.8	1.8
20	2.69	2.15		2.95	3.3	5.4		2.7	1.8	
21	3.14	2.30		3.1	3.7	5.4		2.6	1.75	
22	3.72	2.30		3.3	3.8	5.3		2.55	1.75	1.75
23	3.45	2.30		3.5	4.2	5.2		2.5	1.75	1.75
24	3.20			3.4	4.8	5.4		2.45	1.7	1.75
25	3.06			3.3	5.4	5.3			1.7	
26	2.90			3.1	5.7	5.2			1.7	
27				3.0	5.9	5.2		2.3	1.7	1.8
28		2.20		2.9	5.6	5.0		2.3	1.65	1.75
29		2.18		2.85	5.2	4.9		2.25		1.75
30		2.17		3.1	5.0	5.2		2.22	1.6	1.7
31		2.16		3.4		5.7			1.6	

NOTE.—River frozen over Jan. 1 to Mar. 13, 1911, and gage heights seriously affected by ice. No heights reported Jan. 12 to Mar. 13, 1911.

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[1] Formerly known as Lochsa Fork of Clearwater River.

Daily discharge, in second-feet, of Lochsa River near Lowell, Idaho, for the year ending Sept. 30, 1911.

Day.	Nov.	Dec.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	2,020	....	3,790	6,670	10,900	5,280	1,140	499
2	....	2,010	....	4,410	7,140	11,900	5,280	1,160	499
3	....	1,990	....	4,200	8,370	11,900	5,080	1,180	462
4	....	1,950	....	3,790	9,110	12,400	4,630	1,190	579
5	....	1,910	....	3,690	10,900	10,100	4,200	1,210	967
6	....	1,870	....	3,590	12,400	9,110	3,790	1,210	1,350
7	....	1,820	....	3,490	9,360	10,100	3,790	1,350	1,150
8	2,920	1,780	....	3,390	8,370	11,600	3,390	1,250	912
9	2,590	1,740	....	3,290	8,370	10,400	3,390	1,150	857
10	3,100	1,700	....	3,190	7,880	9,360	3,000	1,050	711
11	4,140	1,660	....	3,190	6,900	11,100	2,810	955	665
12	3,830	1,620	....	3,000	7,390	12,400	2,620	856	665
13	3,080	1,580	....	2,620	7,630	14,200	2,500	757	622
14	2,680	1,540	967	2,440	6,900	12,200	2,380	757	579
15	2,360	1,490	1,150	2,550	7,390	11,600	2,270	757	579
16	2,020	1,450	1,350	2,660	8,860	9,760	2,270	757	638
17	1,860	1,410	1,490	2,770	9,360	9,370	2,100	711	697
18	1,970	1,370	1,700	2,880	8,610	8,970	1,940	711	757
19	1,860	1,110	1,860	3,000	8,370	8,570	1,860	665	665
20	1,760	1,030	2,190	2,810	7,390	8,160	1,780	665	650
21	2,520	1,210	2,440	3,590	7,390	7,770	1,630	622	636
22	3,630	1,210	2,810	3,790	7,140	7,320	1,560	622	622
23	3,100	1,210	3,190	4,630	6,900	6,910	1,490	622	622
24	2,620	1,190	3,000	5,960	7,390	6,510	1,420	579	622
25	2,370	1,160	2,810	7,390	7,140	6,110	1,350	579	636
26	2,100	1,140	2,440	8,120	6,900	5,680	1,280	579	650
27	2,090	1,110	2,270	8,610	6,900	5,090	1,210	579	665
28	2,070	1,090	2,100	7,880	6,430	5,680	1,210	539	622
29	2,050	1,060	2,020	6,900	6,200	5,490	1,150	519	622
30	2,040	1,050	2,440	6,430	6,900	5,680	1,110	499	579
31	....	1,040	3,000	....	8,120	....	1,130	499	....

NOTE.—Discharge determined from a rating curve well defined between 600 and 5,000 second-feet. No attempt has been made to estimate discharge during the frozen season. Discharge June 14 to July 3, 1911, estimated by comparison with the records of Selwa River. Discharge interpolated for all other days when no gage height was reported.

Monthly discharge of Lochsa River near Lowell, Idaho, for the year ending Sept. 30, 1911.

[Drainage area, 1,170 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
November 8-30	4,140	1,760	2,550	2.18	1.86	116,000	A.
December	2,020	1,030	1,470	1.26	1.45	90,400	C.
March 14-31	3,190	967	2,180	1.86	1.24	77,800	A.
April	8,610	2,440	4,270	3.65	4.07	254,000	A.
May	12,400	6,200	7,900	6.75	7.78	486,000	B.
June	14,200	5,090	9,210	7.87	8.78	548,000	B.
July	5,280	1,110	2,550	2.18	2.51	157,000	A.
August	1,350	499	830	.709	.82	51,000	B.
September	1,350	462	693	.592	.66	41,200	A.

SOUTH FORK OF CLEARWATER RIVER NEAR GRANGEVILLE, IDAHO.

Location.—Just below a power plant in the SE. ¼ NE. ¼ sec. 30, T. 30 N., R. 4 E., about 6 miles east of Mount Idaho post office, 10 miles east of Grangeville, and about 25 miles above the mouth.

Records available.—November 14, 1910, to July 31, 1911.

Drainage area.—940 square miles.

Gage.—Vertical staff about 75 yards below the power plant.

Channel.—Rock; two channels at high water.

Discharge measurements.—Made from a cable.

Winter flow.—Affected by ice.

Accuracy.—Rating curve well defined; results probably good, though the accuracy may be affected somewhat by artificial control of the water at the power plant.

Cooperation.—Gage-height record furnished by Grangeville Electric Light & Power Co., and some discharge measurements furnished by the United States Forest Service.

Discharge measurements of South Fork of Clearwater River near Grangeville, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910		*Feet.*	*Sec.-ft.*	1911		*Feet.*	*Sec.-ft.*
Nov. 14	F. C. Ebert	1.25	360	Mar. 8	J. P. Martin	(a)	292
				May 28[b]	F. C. Ebert	3.90	2,310
				July 19	E. W. Kramer	1.80	702

[a] Ice piled around gage, which was not read.
[b] Surface velocities observed and coefficient of 0.85 used to obtain mean velocity.

Daily gage height, in feet, of South Fork of Clearwater River near Grangeville, Idaho, for the year ending Sept. 30, 1911.

Day.	Nov.	Dec.	Jan.	Mar.	Apr.	May.	June.	July.
1	....	1.2	1.0	....	2.9	3.4	4.3	5.0
2	....	1.25	1.1	....	3.3	3.7	4.2	4.9
3	....	1.2	1.5	....	2.8	3.8	4.3	4.5
4	....	1.6	1.25	....	2.5	4.1	4.5	4.3
5	....	1.4	1.1	....	2.3	4.2	4.5	4.0
6	....	1.2	1.0	....	2.0	4.6	4.2	3.6
7	....	1.3	1.0	....	2.1	4.3	4.9	3.1
8	....	1.2	1.0	....	2.1	4.3	4.5	2.9
9	....	1.25	1.0	....	2.5	4.1	4.4	2.4
10	....	.95	1.0	....	2.4	4.1	4.2	2.15
11	....	1.15	.95	....	2.25	3.8	4.2	1.85
12	....	1.1	.95	1.05	2.1	3.6	4.0	1.55
13	....	1.0	.95	1.1	2.05	3.3	4.1	1.55
14	1.25	.9	.95	1.2	2.0	3.5	3.9	1.6
15	1.15	.9	.95	1.3	1.9	4.0	3.9	1.55
16	1.25	1.3	1.0	1.4	2.0	5.0	3.6	1.55
17	1.2	1.2	1.1	1.5	2.1	4.8	3.5	1.6
18	1.15	1.05	1.15	1.65	2.2	4.6	3.3	1.65
19	1.15	1.0	1.0	1.85	2.3	4.4	3.3	1.6
20	1.15	1.0	.9	2.05	2.5	4.4	3.0	1.55
21	1.45	1.1	.9	2.25	2.6	4.3	3.0	1.55
22	1.95	1.05	.9	2.3	3.0	4.3	2.8	1.55
23	1.6	1.1	.85	2.4	3.1	4.2	2.9	1.5
24	1.5	1.05	.95	2.5	3.4	4.2	3.5	1.45
25	1.4	1.25	....	2.35	3.8	4.0	3.0	1.45
26	1.2	.95	....	1.75	4.0	4.1	2.9	1.4
27	.95	1.0	....	1.9	4.2	3.9	3.6	1.35
28	1.2	1.0	....	1.8	4.0	4.0	3.9	1.25
29	1.3	.95	....	1.85	3.8	3.8	4.3	1.25
30	1.25	.95	....	2.2	3.5	3.9	4.5	....
31	....	.95	....	2.6	....	3.7	....	....

NOTE.—No gage heights reported Jan. 25 to Mar. 11. Ice was piled around the gage at the time of the measurement on Mar. 8, and it is probable that the stream was frozen Jan. 25 to Mar. 11. No record for July 30 to Sept. 30.

Daily discharge, in second-feet, of South Fork of Clearwater River near Grangeville, Idaho, for the year ending Sept. 30, 1911.

Day.	Nov.	Dec.	Jan.	Mar.	Apr.	May.	June.	July.
1	....	348	260	....	1,420	1,840	2,740	3,590
2	....	372	303	....	1,750	2,110	2,630	3,460
3	....	348	495	....	1,340	2,210	2,740	2,970
4	....	547	372	....	1,110	2,520	2,970	2,740
5	....	444	303	....	968	2,630	2,970	2,410
6	....	348	260	....	775	3,090	2,630	2,020
7	....	395	260	....	837	2,740	3,460	1,580
8	....	348	260	....	837	2,740	2,970	1,420
9	....	372	260	....	1,110	2,520	2,850	1,040
10	....	240	260	....	1,040	2,520	2,630	869
11	....	326	240	....	934	2,210	2,630	686
12	....	303	240	282	837	2,020	2,410	521
13	....	260	240	303	806	1,750	2,520	521
14	372	220	240	348	775	1,930	2,310	547
15	326	220	240	395	715	2,410	2,310	521
16	372	395	260	444	775	3,590	2,020	521
17	348	348	303	495	837	3,330	1,930	547
18	326	282	326	574	901	3,090	1,750	574
19	326	260	260	686	968	2,850	1,750	547
20	326	260	220	806	1,110	2,850	1,500	521
21	470	303	220	934	1,180	2,740	1,500	521
22	745	282	220	968	1,500	2,740	1,340	521
23	547	303	202	1,040	1,580	2,630	1,420	495
24	495	282	240	1,110	1,840	2,630	1,930	470
25	444	372	....	1,000	2,210	2,410	1,500	470
26	348	240	....	629	2,410	2,520	1,420	444
27	240	260	....	715	2,630	2,310	2,020	420
28	348	260	....	657	2,410	2,410	2,310	372
29	395	240	....	686	2,210	2,210	2,740	372
30	372	240	....	901	1,930	2,310	2,970	360
31	....	240	....	1,180	....	2,110	....	350

NOTE.—Discharge determined from a well-defined rating corve. Discharge July 30 and 31 estimated to complete the month.

Monthly discharge of South Fork of Clearwater River near Grangeville, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
November 14–30	745	240	400	13,500	A.
December	547	220	312	19,200	A.
January 1–24	495	202	270	12,900	A.
March 12–31	1,180	282	708	28,100	A.
April	2,630	715	1,320	78,600	A.
May	3,590	1,750	2,520	155,000	A.
June	3,460	1,340	2,300	137,000	A.
July	3,590	350	1,050	64,600	A.

SOUTH FORK OF CLEARWATER RIVER AT KOOSKIA, IDAHO.

Location.—In sec. 5, T. 32 N., R. 4 E., at the highway bridge at Kooskia, half a mile above the mouth of South Fork.

Records available.—October 1, 1910, to September 30, 1911.

Drainage area.—1,270 square miles.

Gage.—Vertical staff on right abutment of bridge.

Channel.—Gravel; somewhat shifting.

Discharge measurements.—Made from the highway bridge.

Winter flow.—Seriously affected by ice.

Accuracy.—Results fair; gage-height record probably unreliable at times.

Cooperation.—Gage-height record and some discharge measurements furnished by the United States Forest Service.

Discharge measurements of South Fork of Clearwater River at Kooskia, Idaho, in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Nov. 10	Ebert and Kramer.....	1.62	470	Mar. 11	J. P. Martin............	1.75	533
				May 31	F. C. Ebert............	2.50	2,230

Daily gage height, in feet, of South Fork of Clearwater River at Kooskia, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	1.6	1.6	......	1.6	1.3	1.4	2.6	2.35	3.5	1.5	1.3
2	1.45	1.6	1.6	......	1.7	1.3	1.4	2.7	2.7	3.2	1.5	1.3
3	1.5	1.7	1.7	......	1.7	1.3	1.4	2.7	2.35	3.1	1.5	1.3
4	1.6	1.6	1.65	......	1.6	1.3	1.6	2.8	2.4	3.0	1.5	......
5	1.6	1.6	1.7	......	1.6	1.35	1.6	3.0	2.6	2.8	1.5	......
6	1.5	1.5	1.6	......	1.5	1.65	1.5	3.2	2.5	2.6	1.5	......
7	1.4	1.4	1.5	......	1.5	1.85	1.6	3.0	2.5	2.4	1.45	......
8	1.4	1.7	1.4	1.4	1.5	1.7	1.5	2.9	2.65	2.4	1.45	......
9	1.4	1.85	1.6	1.4	1.4	1.85	1.7	2.6	3.2	2.4	1.42	......
10	1.3	1.85	1.5	1.4	1.4	1.9	1.8	2.6	3.2	2.4	1.42	......
11	1.3	1.9	1.6	1.4	1.4	1.8	1.8	2.6	2.9	2.4	1.4	......
12	1.3	1.9	1.5	1.45	1.4	1.8	1.8	2.5	2.8	2.3	1.4	......
13	1.3	1.75	1.5	1.4	1.4	1.8	1.8	2.5	2.9	2.3	1.4	......
14	1.35	1.7	1.4	1.4	1.4	1.8	1.8	2.5	2.7	2.2	1.4	......
15	1.3	1.6	1.4	1.4	1.4	1.8	1.8	2.5	2.7	2.1	1.4	......
16	1.3	1.5	1.4	1.4	1.4	1.8	1.8	3.6	2.7	2.1	1.4	......
17	1.3	1.5	1.4	1.4	1.4	1.8	1.8	3.25	2.6	2.1	1.35	1.4
18	1.5	1.4	1.4	1.4	1.4	1.8	1.7	3.0	2.6	2.0	1.35	1.4
19	1.8	1.5	1.4	1.4	1.4	1.8	1.7	2.8	2.6	1.8	1.3	1.4
20	1.7	1.6	1.4	1.3	1.4	2.0	1.7	2.7	2.5	1.8	1.3	1.4
21	1.6	1.7	1.4	1.3	1.3	2.0	1.6	2.7	2.5	1.8	1.3	1.4
22	1.5	1.9	1.4	1.4	1.3	2.0	1.6	2.6	2.4	1.8	1.3	1.4
23	1.35	1.8	1.4	1.4	1.3	2.0	1.7	2.5	2.3	1.7	1.3	1.4
24	1.45	1.7	1.3	1.4	1.3	2.3	2.0	2.5	2.3	1.7	1.3	1.4
25	1.5	1.7	......	1.4	1.3	2.05	2.5	2.5	2.3	1.6	1.3	1.4
26	1.6	1.7	......	1.4	1.3	2.0	2.6	2.5	2.25	1.6	1.3	1.4
27	1.45	1.6	......	1.4	1.3	2.0	2.6	2.5	2.2	1.6	1.3	1.4
28	1.5	1.7	......	1.4	1.3	2.0	2.6	2.4	2.2	1.6	1.3	1.4
29	1.4	1.7	......	1.4	......	1.8	2.7	2.4	2.45	1.6	1.3	1.4
30	1.4	1.6	1.3	1.4	......	1.4	2.6	2.4	3.3	1.6	1.3	1.5
31	1.6	......	1.3	1.5	......	1.4	......	2.45	......	1.5	1.3	......

NOTE.—Ice piled up around gage Jan. 1 to 7, 1911, and gage not read. Gage heights not seriously affected by ice at other times. Gage-height record for certain periods believed to be unreliable. See footnote to daily discharge table.

Daily discharge, in second-feet, of South Fork of Clearwater River at Kooskia, Idaho, for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	335	450	450	225	380	170	....	2,240	....	4,400	295	170
2	335	450	450	225	475	170	....	2,480	....	3,680	295	170
3	370	560	560	225	475	170	....	2,480	....	3,440	295	170
4	450	450	505	225	380	170	....	2,720	....	3,200	295	173
5	450	450	560	225	380	198	....	3,200	....	2,720	295	177
6	370	370	450	225	295	428	....	3,680	....	2,240	295	181
7	300	300	370	225	295	675	....	3,200	....	1,770	260	185
8	300	560	300	225	295	475	....	2,960	....	1,770	260	189
9	300	778	450	225	225	675	....	2,240	3,680	1,770	239	193
10	235	778	370	225	225	750	....	2,240	3,680	1,770	239	197
11	235	860	450	225	225	600	....	2,240	2,960	1,770	225	201
12	235	860	370	260	225	600	....	2,000	2,720	1,550	225	205
13	235	628	370	225	225	600	....	2,000	2,960	1,550	225	209
14	268	560	300	225	225	600	....	2,000	2,480	1,340	225	213
15	235	450	300	225	225	600	....	2,000	2,480	1,130	225	217
16	235	370	300	225	225	600	....	4,650	2,480	1,130	225	221
17	235	370	300	225	225	600	....	3,800	2,240	1,130	198	225
18	370	300	300	225	225	600	....	3,200	2,240	935	198	225
19	695	370	300	225	225	600	....	....	2,240	600	170	225
20	560	450	300	170	225	935	....	....	2,000	600	170	225
21	450	560	300	170	170	935	....	....	2,000	600	170	225
22	370	860	300	225	170	935	....	....	1,770	600	170	225
23	268	695	300	225	170	935	....	....	1,550	475	170	225
24	335	560	235	225	170	1,550	....	....	1,550	475	170	225
25	370	560	235	225	170	1,030	....	....	1,550	380	170	225
26	450	560	235	225	170	935	....	....	1,440	380	170	225
27	335	450	235	225	170	935	....	....	1,340	380	170	225
28	370	560	235	225	170	935	....	....	1,340	380	170	225
29	300	560	235	225	....	950	2,480	....	1,880	380	170	225
30	300	450	235	225	....	1,300	2,240	....	3,920	380	170	295
31	450	....	235	295	....	1,500	....	....	....	295	170	....

NOTE.—Discharge, except as noted below, determined from two fairly well defined rating curves, one applicable to gage heights for 1910, the other to heights for 1911. Discharge Jan. 1 to 7 estimated because of ice. Discharges interpolated for days in December and September for which gage heights are missing. Discharge estimated from hydrograph comparisons with record of stations at Grangeville and Kamiah for the following periods for which the gage height records are probably unreliable: Mar. 29 to 31, as given in table; Apr. 1 to 20, mean discharge 1,250 second-feet; Apr. 21 to 28, 2,400 second-feet; May 19 to 31, 2,700 second-feet; June 1 to 8, 3,000 second-feet.

Monthly discharge of South Fork of Clearwater River at Kooskia, Idaho, for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	695	235	347	21,300	B.
November	860	300	539	32,100	B.
December	560	235	340	20,900	B.
January	295	170	225	13,800	C.
February	475	170	251	13,900	B.
March	1,550	170	715	44,000	B.
April	....	....	1,630	97,000	D.
May	4,650	....	2,720	167,000	C.
June	3,920	....	2,480	148,000	C.
July	4,400	295	1,390	85,500	B.
August	295	170	217	13,300	B.
September	295	170	210	12,500	B.
The year	4,650	170	925	669,000	

PALOUSE RIVER AT HOOPER, WASH.

Location.—In sec. 25, T. 15 N., R. 38 E., 1 mile east of Hooper and 2 miles above Cow Creek.

Records available.—April 1, 1897, to December 31, 1899; April 1, 1900, to April 21, 1907; June 14, 1908, to September 30, 1911.

Dranage area.—2,210 square miles.

Gage.—Vertical and inclined staff in four sections on the right bank.

Channel.—Rocks and gravel; shifting in floods.

Discharge measurements.—Made by wading.

Winter flow.—Not seriously affected by ice.

Diversions.—A considerable amount of diversion for irrigation above the gage.

Accuracy.—Results fair.

Discharge measurements of Palouse River at Hooper, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Nov. 1	Ebert and Story	1.12	44.1	Sept. 24	Charles Leid	0.90	20.1

Daily gage height, in feet, of Palouse River at Hooper, Wash., for the year ending Sept. 30, 1911.

[Mrs. L. C. Huffman, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.05	1.1	1.9	2.10	2.15	2.40	4.2	2.70	2.50	1.40	0.60	0.60
2	1.0	1.1	1.85	1.95	2.70	2.25	4.2	2.60	2.40	1.35	.70	.60
3	1.0	1.1	2.15	1.95	2.70	2.50	4.3	2.65	2.40	1.35	.70	.60
4	1.0	1.1	2.0	1.95	2.75	2.60	4.4	2.60	2.25	1.35	.70	.65
5	1.0	1.1	2.1	2.00	2.95	2.90	4.2	2.60	2.20	1.35	.78	.65
6	1.0	1.1	2.3	2.05	2.90	3.5	4.0	2.60	2.20	1.25	.75	.68
7	1.0	1.1	2.4	2.00	2.95	4.5	3.8	2.65	2.15	1.25	.70	.78
8	.9	1.1	2.65	2.00	2.50	6.2	3.4	2.65	2.00	1.25	.70	.78
9	.9	1.1	2.6	2.70	2.50	6.6	3.3	2.75	1.95	1.25	.70	.80
10	1.0	1.3	2.6	2.60	2.50	7.3	3.1	2.75	1.85	1.25	.70	.85
11	1.0	1.4	2.5	2.60	2.50	7.5	3.0	2.85	1.95	1.00	.70	.85
12	1.0	1.45	2.5	2.50	2.50	6.8	3.2	2.75	1.90	.90	.70	.85
13	1.05	1.45	2.45	2.40	2.50	6.0	3.3	2.65	1.90	.95	.60	.85
14	1.1	1.5	2.45	2.00	2.65	5.7	3.2	2.35	1.60	1.00	.60	.85
15	1.05	1.6	2.4	1.90	2.60	5.6	3.2	2.35	1.60	1.05	.60	.85
16	1.05	1.6	2.1	1.95	2.50	5.6	3.0	2.45	1.60	1.00	.60	.85
17	1.1	1.65	2.05	1.90	2.40	5.4	2.90	2.40	1.60	1.00	.60	.90
18	1.1	1.7	2.0	1.45	2.40	5.3	2.70	2.60	1.60	1.00	.60	.85
19	1.0	1.65	2.0	2.15	2.40	5.2	2.70	4.0	1.40	1.05	.62	.80
20	1.1	1.6	2.0	2.40	2.40	5.2	2.70	3.6	1.40	1.05	.65	.80
21	1.1	1.65	2.0	2.40	2.35	5.0	2.70	3.5	1.35	1.05	.65	.80
22	1.05	1.75	2.0	2.30	2.35	5.0	2.70	3.4	1.30	1.00	.65	.80
23	1.0	2.0	2.0	2.25	2.35	5.0	2.90	3.2	1.30	.90	.60	.80
24	1.05	2.75	2.1	2.15	2.35	4.9	2.85	3.1	1.30	.90	.60	.80
25	1.05	2.55	2.4	2.00	2.35	5.0	3.0	3.0	1.35	.90	.60	.80
26	1.1	2.5	2.5	2.00	2.30	5.3	3.1	2.90	1.40	.90	.60	.85
27	1.1	2.3	2.35	1.95	2.20	5.0	3.2	2.85	1.40	.90	.60	.85
28	1.1	2.15	2.3	1.95	1.95	4.6	3.2	2.70	1.40	.50	.58	.85
29	1.1	2.0	2.3	2.00	......	4.4	3.1	2.70	1.40	.50	.58	.85
30	1.05	1.9	2.2	2.15	......	4.2	3.0	2.70	1.40	.50	.60	.85
31	1.1	......	2.15	2.15	......	4.1	......	2.45	......	.50	.60	......

Daily discharge, in second-feet, of Palouse River at Hooper, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	38	42	165	209	221	284	915	363	310	78	5	5
2	33	42	155	176	363	246	915	336	284	72	9	5
3	33	42	221	176	363	310	965	350	284	72	9	5
4	33	42	186	176	377	336	1,020	336	246	72	9	7
5	33	42	209	186	435	420	915	336	233	72	13	7
6	33	42	258	198	420	610	815	336	233	58	12	8.2
7	33	42	284	186	435	1,080	730	350	221	58	9	13
8	25	42	350	186	310	2,290	575	350	186	58	9	13
9	25	42	336	363	310	2,650	540	377	176	58	9	14
10	33	65	336	336	310	3,330	480	377	155	58	9	17
11	33	78	310	336	310	3,530	450	406	176	29	9	17
12	33	85	310	310	310	2,840	510	377	165	20	9	17
13	38	85	297	284	310	2,120	540	350	165	24	5	17
14	42	92	297	186	350	1,880	510	271	108	29	5	17
15	38	188	284	165	336	1,800	510	271	108	34	5	17
16	38	108	209	176	310	1,800	450	297	108	29	5	17
17	42	117	198	165	284	1,650	420	284	108	29	5	20
18	42	126	186	85	284	1,580	363	336	108	29	5	17
19	33	117	186	221	284	1,510	363	815	78	34	5.8	14
20	42	108	186	284	284	1,510	363	650	78	34	7	14
21	42	117	186	284	271	1,380	363	610	72	34	7	14
22	38	136	186	258	271	1,380	363	575	65	29	7	14
23	33	186	186	246	271	1,380	420	510	65	20	5	14
24	38	377	209	221	271	1,320	406	480	65	20	5	14
25	38	323	284	186	271	1,380	450	450	72	20	5	14
26	42	310	310	186	258	1,580	480	420	78	20	5	17
27	42	258	271	176	233	1,380	510	406	78	20	5	17
28	42	221	258	176	176	1,140	510	363	78	2	4.4	17
29	42	186	258	186	....	1,020	480	363	78	2	4.4	17
30	38	165	233	221	....	915	450	363	78	2	5	17
31	42	....	221	221	....	865	....	297	....	2	5	....

NOTE.—Discharge determined from a rating curve fairly well defined between 20 and 15,000 second-feet.

Monthly discharge of Palouse River at Hooper, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	42	25	36.7	2,260	B.
November	377	42	125	7,440	B.
December	350	155	244	15,000	B.
January	363	85	218	13,400	B.
February	435	176	308	17,100	B.
March	3,530	246	1,470	90,400	B.
April	1,020	363	559	33,300	B.
May	815	271	400	24,600	B.
June	310	65	142	8,450	B.
July	78	2.0	36.1	2,220	B.
August	13	4.4	6.83	420	C.
September	20	5.0	13.9	827	B.
The year	3,530	2.0	297	215,000	

SOUTH FORK OF WALLA WALLA RIVER NEAR MILTON, OREG.

Location.—In the SE. ¼ sec. 9, T. 4 N., R. 37 E., one-fourth mile above the headgate of the pipe line of the Pacific Power & Light Co., about 12 miles above Milton; above all diversions.

Records available.—August 10 to September 15, 1906; January 1, 1907, to March 14, 1908; October 14, 1908, to September 30, 1911. At point 6 miles below the present site February 16, 1903, to May 29, 1906.

Drainage area.—72 square miles.

Gage.—Vertical staff.

Channel.—Gravel and small bowlders; practically permanent.

Discharge measurements.—Made by wading near gage.

Winter flow.—Not affected by ice.

Accuracy.—Records good.

Cooperation.—Gage heights furnished by the Pacific Power & Light Co.

No discharge measurements made during the year.

Daily gage height, in feet, of South Fork of Walla Walla River near Milton Oreg., for the year ending Sept. 30, 1911.

[John Munson, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.6	2.6	2.8	2.7	2.8	2.6	3.1	3.1	3.1	2.7	2.6	2.5
2	2.6	2.6	2.8	2.7	2.8	2.6	3.1	3.1	3.1	2.7	2.6	2.5
3	2.85	2.6	2.9	2.7	2.8	2.6	3.1	3.2	3.1	2.7	2.6	2.5
4	2.7	2.6	3.1	2.7	2.8	2.8	3.1	3.2	3.0	2.7	2.6	2.5
5	2.6	2.6	3.0	2.7	2.8	2.8	3.0	3.2	3.0	2.7	2.6	2.5
6	2.6	2.6	3.0	2.7	2.8	3.0	3.0	3.2	3.0	2.6	2.6	2.6
7	2.6	2.6	3.0	2.9	2.8	3.1	3.0	3.1	3.0	2.6	2.6	2.6
8	2.6	2.8	2.9	2.9	2.8	3.0	3.0	3.1	2.9	2.6	2.6	2.6
9	2.6	2.7	2.9	2.8	2.8	3.0	3.0	3.1	2.9	2.6	2.6	2.6
10	2.6	2.7	2.9	2.7	2.8	3.0	3.0	3.0	2.9	2.6	2.6	2.6
11	2.6	2.9	2.8	2.7	2.8	2.8	3.0	3.0	2.9	2.6	2.6	2.6
12	2.6	2.8	2.8	2.7	2.8	2.8	2.9	3.0	2.8	2.6	2.5	2.6
13	2.6	2.7	2.8	2.7	2.8	2.8	2.9	3.0	2.8	2.6	2.5	2.6
14	2.6	2.7	2.8	2.7	2.8	2.8	2.9	3.0	2.8	2.6	2.5	2.6
15	2.6	2.7	2.8	2.7	2.8	2.8	2.9	3.0	2.8	2.6	2.5	2.6
16	2.6	2.7	2.8	2.7	2.8	2.8	2.9	3.4	2.8	2.6	2.5	2.6
17	2.65	2.7	2.7	2.7	2.7	2.9	2.9	3.4	2.8	2.6	2.5	2.6
18	2.6	2.7	2.7	2.7	2.7	3.0	2.9	3.6	2.8	2.6	2.5	2.6
19	2.6	2.7	2.7	2.7	2.6	3.0	2.9	3.5	2.8	2.6	2.5	2.6
20	2.6	2.75	2.7	2.7	2.6	3.2	2.9	3.4	2.8	2.6	2.5	2.5
21	2.6	3.2	2.7	2.7	2.6	3.2	3.0	3.3	2.8	2.6	2.5	2.5
22	2.6	3.05	2.7	2.7	2.6	3.3	3.0	3.3	2.7	2.6	2.5	2.5
23	2.6	3.2	2.7	2.7	2.6	3.2	3.2	3.2	2.7	2.6	2.5	2.5
24	2.6	3.0	2.7	2.7	2.6	3.2	3.4	3.2	2.7	2.6	2.5	2.5
25	2.6	2.9	2.7	2.7	2.6	3.1	3.4	3.2	2.7	2.6	2.5	2.5
26	2.6	2.8	2.7	2.7	2.6	3.2	3.3	3.2	2.7	2.6	2.5	2.5
27	2.6	2.8	2.7	2.7	2.6	3.4	3.2	3.2	2.7	2.6	2.5	2.5
28	2.6	2.8	2.7	2.7	2.6	3.3	3.2	3.1	2.7	2.6	2.5	2.5
29	2.6	2.8	2.7	2.8	....	3.3	3.1	3.1	2.7	2.6	2.5	2.5
30	2.6	2.8	2.7	2.8	....	3.2	3.0	3.1	2.7	2.6	2.5	2.5
31	2.6	....	2.7	2.8	....	3.2	....	3.1	....	2.6	2.5	....

Daily discharge, in second-feet, of South Fork of Walla Walla River near Milton, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	107	107	147	126	147	107	224	224	224	126	107	91
2	107	107	147	126	147	107	224	224	224	126	107	91
3	158	107	170	126	147	107	224	254	224	126	107	91
4	126	107	224	126	147	147	224	254	196	126	107	91
5	107	107	196	126	147	147	196	254	196	126	107	91
6	107	107	196	126	147	196	196	254	196	107	107	107
7	107	107	196	170	147	224	196	224	196	107	107	107
8	107	147	170	170	147	196	196	224	170	107	107	107
9	107	126	170	147	147	196	196	224	170	107	107	107
10	107	126	170	126	147	196	196	196	170	107	107	107
11	107	170	147	126	147	147	196	196	170	107	107	107
12	107	147	147	126	147	147	170	196	147	107	91	107
13	107	126	147	126	147	147	170	196	147	107	91	107
14	107	126	147	126	147	147	170	196	147	107	91	107
15	107	126	147	126	147	147	170	196	147	107	91	107
16	107	126	147	126	147	147	170	318	147	107	91	107
17	116	126	126	126	126	170	170	318	147	107	91	107
18	107	126	126	126	126	196	170	390	147	107	91	107
19	107	126	126	126	107	196	170	352	147	107	91	107
20	107	136	126	126	107	254	170	318	147	107	91	91
21	107	254	126	126	107	254	196	286	147	107	91	91
22	107	210	126	126	107	286	196	286	126	107	91	91
23	107	254	126	126	107	254	254	254	126	107	91	91
24	107	196	126	126	107	254	318	254	126	107	91	91
25	107	170	126	126	107	224	318	254	126	107	91	91
26	107	147	126	126	107	254	286	254	126	107	91	91
27	107	147	126	126	107	318	254	254	126	107	91	91
28	107	147	126	126	107	286	254	224	126	107	91	91
29	107	147	126	147	....	286	224	224	126	107	91	91
30	107	147	126	147	....	254	196	224	126	107	91	91
31	107	....	126	147	....	254	....	224	....	107	91	....

NOTE.—Discharge determined from a rating curve well defined between 90 and 360 second-feet.

Monthly discharge of South Fork of Walla Walla River near Milton, Oreg., for the year ending Sept. 30, 1911.

[Drainage area, 72 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	158	107	110	1.53	1.76	6,760	A.
November	254	107	143	1.99	2.22	8,510	A.
December	224	126	147	2.04	2.35	9,040	A.
January	170	126	132	1.83	2.11	8,120	A.
February	147	107	131	1.82	1.90	7,280	A.
March	318	107	201	2.79	3.22	12,400	A.
April	318	170	210	2.92	3.26	12,500	A.
May	390	196	250	3.47	4.00	15,400	A.
June	224	126	158	2.19	2.44	9,400	A.
July	126	107	110	1.53	1.76	6,760	A.
August	107	91	96.7	1.34	1.54	5,950	A.
September	107	91	98.5	1.37	1.53	5,860	A.
The year	390	91	149	2.07	28.09	108,000	

UMATILLA RIVER AT GIBBON, OREG.

Location.—In the NW. ¼ sec. 36, T. 3 N., R. 35 E., on the Umatilla Indian Reservation, 1 mile below Gibbon railroad station, about 1½ miles below the mouth of Meacham Creek, and 2 miles above the mouth of Squaw Creek; above all diversions.

Records available.—July 22, 1896, to December 31, 1899; April 15, 1900, to May 29, 1906; December 3, 1906, to March 31, 1907; September 13, 1907, to September 30, 1911.

Drainage area.—353 square miles.

Gage.—Vertical staff in two sections; datum unchanged since December 3, 1906. Gages at several locations and datums used during life of station.

Channel.—Gravel; likely to shift during floods.

Discharge measurements.—Made from a cable near the gage or at low water by wading.

Winter flow.—Not affected by ice.

Artificial control.—No water stored or diverted above station.

Accuracy.—Results since 1907 good; estimates of extreme high-water discharge uncertain.

No discharge measurements made during the year.

Daily gage height, in feet, of Umatilla River at Gibbon, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.15	0.2	1.45	0.85	1.1	1.05	2.5	1.45	1.6	0.45	0.1	0.05
2	.15	.2	1.45	.85	1.15	1.2	2.35	1.5	1.5	.45	.1	.05
3	.35	.2	1.7	.9	1.15	1.3	2.2	1.5	1.35	.4	.1	.05
4	.3	.2	2.65	.9	1.15	1.45	2.1	1.55	1.3	.4	.1	.05
5	.2	.2	2.0	.95	1.2	1.6	1.95	1.6	1.2	.35	.1	.1
6	.2	.2	1.75	.95	1.15	1.65	1.85	1.55	1.1	.35	.1	.3
7	.2	.2	1.65	1.0	1.05	2.1	1.8	1.45	1.05	.35	.1	.1
8	.2	.3	1.55	1.15	1.05	2.1	1.7	1.4	1.0	.3	.1	.1
9	.2	.5	1.65	1.15	1.0	1.9	1.7	1.4	.95	.3	.1	.1
10	.2	.5	1.6	1.05	1.0	1.85	1.65	1.35	.95	.3	.1	.15
11	.2	.8	1.5	1.0	1.0	1.8	1.6	1.3	.85	.25	.1	.1
12	.2	.8	1.45	1.0	.95	1.75	1.6	1.3	.8	.25	.1	.1
13	.2	.75	1.3	.9	.9	1.75	1.6	1.4	.85	.2	.05	.1
14	.2	.65	1.2	.9	.9	1.85	1.55	1.45	.75	.2	.05	.1
15	.2	.6	1.05	.9	.85	1.9	1.55	1.5	.7	.2	.05	.1
16	.2	.55	.95	.9	.8	2.1	1.55	3.0	.6	.2	.05	.1
17	.2	.55	.9	.9	.8	2.1	1.5	3.1	.6	.2	.05	.1
18	.2	.5	.9	.85	.8	2.2	1.45	2.9	.6	.2	.05	.1
19	.2	.45	.9	.85	.8	2.15	1.45	3.2	.55	.2	.05	.1
20	.2	.6	.9	.8	.75	2.35	1.5	2.8	.55	.15	.05	.1
21	.2	1.2	.85	.8	.75	2.45	1.6	2.6	.55	.15	.05	.1
22	.2	2.0	.85	.8	.75	2.4	1.65	2.25	.5	.15	.05	.1
23	.2	2.4	.85	.7	.75	2.5	1.75	2.0	.5	.1	.05	.1
24	.2	1.9	.85	.7	.75	2.35	1.8	1.9	.5	.1	.05	.1
25	.2	1.6	.85	.7	.75	2.25	1.85	1.8	.5	.1	.05	.1
26	.2	1.45	.85	.7	.8	2.1	1.9	1.75	.5	.1	.05	.1
27	.2	1.3	.85	.65	.85	1.95	1.85	2.0	.65	.1	.05	.1
28	.2	1.2	.9	.65	.9	1.8	1.7	1.95	.6	.1	.05	.1
29	.2	1.2	.9	.65	......	1.9	1.6	1.9	.5	.1	.05	.1
30	.2	1.3	.9	.7	......	2.05	1.55	1.75	.5	......	.05	.1
31	.2	......	.9	1.0	......	2.3	......	......	......	......	.05	......

Daily discharge, in second-feet, of Umatilla River at Gibbon, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	58	66	500	220	320	298	1,350	500	600	116	50	44
2	58	66	500	220	355	370	1,220	530	530	116	50	44
3	96	66	670	235	355	420	1,080	530	445	106	50	44
4	86	66	1,500	235	355	500	990	565	420	106	50	44
5	66	66	910	255	370	600	870	600	370	96	50	50
6	66	66	710	255	355	635	790	565	320	96	50	86
7	66	66	635	275	298	990	750	500	298	96	50	50
8	66	86	565	345	298	990	670	470	275	86	50	50
9	66	127	635	345	275	830	670	470	255	86	50	50
10	66	127	600	298	275	790	635	445	255	86	50	58
11	66	205	530	275	275	750	600	420	220	76	50	50
12	66	205	500	275	255	710	600	420	205	76	50	50
13	66	190	420	235	235	710	600	470	220	66	44	50
14	66	162	370	235	235	790	565	500	190	66	44	50
15	66	149	298	235	220	830	565	530	175	66	44	50
16	66	138	255	235	205	990	565	1,880	149	66	44	50
17	66	138	235	235	205	990	530	1,990	149	66	44	50
18	66	127	235	220	205	1,080	500	1,770	149	66	44	50
19	66	116	235	220	205	1,040	500	2,100	138	66	44	50
20	66	149	235	205	190	1,220	530	1,660	138	58	44	50
21	66	370	220	205	190	1,300	600	1,450	138	58	44	50
22	66	910	220	205	190	1,260	635	1,120	127	58	44	50
23	66	1,260	220	175	190	1,350	710	910	127	50	44	50
24	66	830	220	175	190	1,220	750	830	127	50	44	50
25	66	600	220	175	190	1,120	790	750	127	50	44	50
26	66	500	220	175	205	990	830	710	127	50	44	50
27	66	420	220	162	220	870	790	910	162	50	44	50
28	66	370	235	162	235	750	670	870	149	50	44	50
29	66	370	235	162	....	830	600	830	127	50	44	50
30	66	420	235	175	....	950	565	710	127	50	44	50
31	66	....	235	275	....	1,170	....	655	....	50	44	....

NOTE.—Discharge determined from a rating curve well defined between 40 and 3,000 second-feet. Discharge interpolated for days when no gage height was reported. Figures for October to December supersede those published in the 1910 report.

Monthly discharge of Umatilla River at Gibbon, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	96	58	67.1	4,130	A.
November	1,260	66	281	16,700	A.
December	1,500	220	420	25,800	A.
January	345	162	229	14,100	B.
February	370	190	253	14,100	A.
March	1,350	298	882	54,200	A.
April	1,350	500	717	42,700	A.
May	2,100	420	860	52,900	A.
June	600	127	228	13,600	A.
July	116	50	71.9	4,420	B.
August	50	44	46.3	2,850	B.
September	86	44	50.7	3,020	B.
The year	2,100	44	343	249,000	

UMATILLA RIVER AT YOAKUM, OREG.

Location.—In sec. 2, T. 2 N., R. 30 E., at the Yoakum wagon bridge, 18 miles below Pendleton and half a mile east of the Yoakum station on the Oregon-Washington Railroad & Navigation Co.'s line.

Records available.—May 5, 1903, to September 30, 1911.

Drainage area.—1,200 square miles.

Gage.—Vertical staff spiked to right abutment of highway bridge; datum has remained unchanged.

Channel.—Gravel; shifts in extreme floods. One channel at all stages. Left bank overflows during extreme floods. Control composed of lava bowlders.

Discharge measurements.—Made from upstream side of highway bridge or at low water by wading.

Winter flow.—River occasionally freezes for short periods.

Artificial control.—Summer flow affected by diversions for irrigation and by the release of stored water from the Furnish reservoir, 5 miles upstream.

Accuracy.—Results good; low-water records for 1911 uncertain on account of lack of measurements.

Cooperation.—Station maintained by the United States Reclamation Service.

No discharge measurements made during the year.

Daily gage height, in feet, of Umatilla River at Yoakum, Oreg., for the year ending Sept. 30, 1911.

[John Doherty, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	3.10	3.25	4.72	4.2	4.1	3.98	6.3	4.8	5.25	3.55	3.3	3.05
2	3.15	3.25	4.92	4.2	4.35	4.0	6.4	4.75	5.1	3.55	3.3	3.05
3	3.25	3.25	4.98	4.1	4.4	4.1	6.3	4.85	4.9	3.52	3.3	3.05
4	3.2	3.25	5.22	4.1	4.4	4.55	6.1	4.9	4.8	3.5	3.3	3.1
5	3.32	3.3	5.62	4.05	4.5	4.9	5.8	4.9	4.7	3.5	3.35	3.1
6	3.3	3.3	5.7	4.05	4.5	4.9	5.6	4.9	4.5	3.5	3.35	3.1
7	3.25	3.25	5.68	4.0	4.5	5.1	5.3	4.8	4.4	3.5	3.35	3.1
8	3.25	3.38	5.6	4.1	4.4	6.6	4.95	4.7	4.4	3.5	3.32	3.1
9	3.22	3.52	5.52	4.3	4.4	6.4	5.0	4.7	4.3	3.5	3.32	3.12
10	3.2	3.58	5.45	4.5	4.35	6.1	5.2	4.6	4.25	3.5	3.35	3.18
11	3.2	3.65	5.38	4.45	4.35	5.9	5.25	4.6	4.15	3.5	3.35	3.3
12	3.2	3.72	5.28	4.4	4.35	5.7	5.2	4.55	4.0	3.5	3.32	3.35
13	3.2	3.82	5.12	4.35	4.3	5.6	5.1	4.5	4.0	3.5	3.32	3.35
14	3.2	3.75	4.95	4.3	4.25	5.7	4.9	4.7	4.0	3.5	3.32	3.35
15	3.2	3.7	4.72	4.2	4.25	5.9	4.8	4.6	3.92	3.5	3.3	3.35
16	3.2	3.65	4.52	4.1	4.2	6.1	4.7	5.45	3.90	3.5	3.3	3.35
17	3.2	3.6	4.45	4.1	4.15	6.2	4.8	6.5	3.78	3.5	3.3	3.3
18	3.22	3.6	4.4	4.1	4.2	6.3	4.8	6.4	3.7	3.45	3.3	3.28
19	3.25	3.6	4.3	4.1	4.2	6.3	4.8	7.1	3.7	3.45	3.3	3.28
20	3.25	3.6	4.25	4.05	4.1	6.4	4.8	7.0	3.7	3.45	3.3	3.28
21	3.25	3.7	4.18	4.0	4.1	6.6	4.85	6.6	3.65	....	3.3	3.25
22	3.25	4.7	4.15	4.0	4.1	6.7	4.9	6.2	3.65	....	3.3	3.25
23	3.25	4.9	4.1	3.95	4.1	6.8	5.0	5.9	3.65	3.45	3.3	3.25
24	3.22	5.18	4.1	3.9	4.05	6.8	5.2	5.6	3.65	3.42	3.3	3.25
25	3.2	5.2	4.1	3.9	4.1	6.6	5.3	5.45	3.65	3.42	3.3	3.25
26	3.2	5.08	4.15	3.9	4.1	6.2	5.4	5.45	3.65	3.4	3.3	3.25
27	3.25	4.98	4.2	3.85	4.0	5.9	5.3	5.8	3.65	3.4	3.3	3.25
28	3.25	4.82	4.2	3.85	3.95	5.7	5.15	6.0	3.68	3.38	3.3	3.25
29	3.25	4.7	4.2	3.85	....	5.6	5.0	5.9	3.65	3.32	3.3	3.25
30	3.25	4.68	4.25	3.85	....	5.6	4.9	5.6	3.6	3.3	3.3	3.2
31	3.25	....	4.25	3.9	....	5.7	....	5.4	....	3.28	3.2	....

NOTE.—River frozen along edges Jan. 16 and 17. Gage heights not seriously affected.

Daily discharge, in second-feet, of Umatilla River at Yoakum, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	36	54	522	285	248	209	1,640	562	820	102	60	32
2	42	54	625	285	346	215	1,740	537	730	102	60	32
3	54	54	659	248	368	248	1,640	588	614	96	60	32
4	47	54	802	248	368	438	1,460	614	562	92	60	36
5	63	60	1,070	232	414	614	1,210	614	512	92	68	36
6	60	60	1,130	232	414	614	1,050	614	414	92	68	36
7	54	54	1,110	215	414	730	850	562	368	92	68	36
8	54	72	1,050	248	368	1,950	642	512	368	92	63	38
9	50	96	994	325	368	1,740	670	512	325	92	63	38
10	47	108	945	414	346	1,460	790	462	305	92	68	45
11	47	124	898	391	346	1,290	820	462	266	92	68	60
12	47	140	838	368	346	1,130	790	438	215	92	63	68
13	47	164	742	346	325	1,050	730	414	215	92	63	68
14	47	147	642	325	305	1,130	614	512	215	92	63	68
15	47	135	522	285	305	1,290	562	462	191	92	60	68
16	47	124	424	248	285	1,460	512	945	185	92	60	68
17	47	112	391	248	266	1,550	562	1,840	154	92	60	60
18	50	112	368	248	285	1,640	562	1,740	135	84	60	57
19	54	112	325	248	285	1,640	562	2,530	135	84	60	57
20	54	112	305	232	248	1,740	562	2,410	135	84	60	57
21	54	135	278	215	248	1,950	588	1,950	124	84	60	52
22	54	512	266	215	248	2,060	614	1,550	124	84	60	52
23	54	614	248	200	248	2,170	670	1,290	124	84	60	52
24	50	778	248	185	232	2,170	790	1,050	124	78	60	52
25	47	790	248	185	248	1,950	850	945	124	78	60	52
26	47	718	266	185	248	1,550	910	945	124	75	60	52
27	54	659	285	172	215	1,290	850	1,210	124	75	60	52
28	54	572	285	172	200	1,130	760	1,370	130	72	60	52
29	54	512	285	172	....	1,050	670	1,290	124	63	60	52
30	54	502	305	172	....	1,050	614	1,050	112	60	60	47
31	54	....	305	185	....	1,130	....	910	....	57	47	....

NOTE.—Discharge determined from a fairly well-defined rating curve.

Monthly discharge of Umatilla River at Yoakum, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off.	Accuracy.
	Maximum.	Minimum.	Mean.	Total in acre-feet.	
October	63	36	50.6	3,110	A.
November	790	54	258	15,400	A.
December	1,130	248	561	34,500	B.
January	414	172	249	15,300	B.
February	414	200	305	16,900	B.
March	2,170	209	1,280	78,700	B.
April	1,740	512	843	50,200	B.
May	2,530	414	996	61,200	B.
June	820	112	270	16,100	B.
July	102	57	85.5	5,260	B.
August	68	47	61.4	3,780	B.
September	68	32	50.2	2,990	B.
The year	2,530	32	419	303,000	

UMATILLA RIVER NEAR UMATILLA, OREG.

Location.—In sec. 21, T. 5 N., R. 28 E., 1½ miles above Umatilla and the mouth of the river, near main line of Oregon-Washington Railroad & Navigation Co., one-fourth mile below diversion point of Oregon Land & Water Co.'s canal.

Records available.—October 21, 1903, to September 30, 1911. Records show the total unappropriated flow of the river.

Drainage area.—2,130 square miles.

Gage.—Inclined staff in two sections.

Channel.—Solid rock without gravel or sand. One channel at all stages.

Discharge measurements.—Made from cable and car.

Winter flow.—Occasionally shore or floating ice; no material effect.

Diversions.—Large part of total flow of river diverted for irrigation above station. The Umatilla project feed canal also diverts water during the winter for storage in the Cold Springs reservoir. The low-water flow is return water from the Hermiston project.

Accuracy.—Results excellent.

The following discharge measurement was made by Charles Leidl:
September 20, 1911: Gage height, 2.40 feet; discharge, 73.8 second-feet.

Daily gage height, in feet, of Umatilla River near Umatilla, Oreg., for the year ending Sept. 30, 1911.

[C. A. Holder, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.3	2.3	2.9	2.45	2.45	2.30	3.5	2.9	3.3	2.45	2.5	2.5
2	2.3	2.35	2.9	2.45	2.5	2.35	3.7	2.9	3.2	2.45	2.5	2.5
3	2.3	2.35	3.1	2.45	2.5	2.35	4.0	2.9	3.1	2.45	2.5	2.5
4	2.3	2.4	3.25	2.45	2.55	2.40	4.1	2.9	2.9	2.5	2.5	2.5
5	2.3	2.4	3.4	2.45	2.6	2.8	3.9	2.9	2.8	2.5	2.5	2.55
6	2.3	2.4	3.5	2.45	2.6	3.3	3.8	3.0	2.7	2.5	2.5	2.55
7	2.3	2.4	3.6	2.45	2.65	3.5	3.5	3.0	2.6	2.5	2.5	2.55
8	2.3	2.35	3.6	2.5	2.65	3.8	3.2	2.9	2.4	2.5	2.5	2.55
9	2.3	2.35	3.5	2.55	2.65	4.1	3.0	2.8	2.30	2.5	2.5	2.55
10	2.25	2.35	3.5	2.65	2.6	4.25	3.0	2.75	2.30	2.45	2.5	2.55
11	2.25	2.3	3.45	2.7	2.5	4.3	2.9	2.7	2.30	2.40	2.5	2.55
12	2.35	2.3	3.35	2.75	2.5	4.1	3.1	2.65	2.30	2.40	2.5	2.55
13	2.35	2.35	3.2	2.8	2.45	4.0	3.1	2.65	2.30	2.40	2.5	2.55
14	2.25	2.35	3.2	2.8	2.45	3.8	3.0	2.6	2.5	2.40	2.5	2.55
15	2.25	2.3	3.1	......	2.45	3.5	3.0	2.7	2.5	2.40	2.5	2.55
16	2.3	2.3	3.0	......	2.40	3.5	2.9	2.7	2.5	2.45	2.5	2.55
17	2.25	2.3	2.9	3.1	2.40	3.7	2.8	3.9	2.5	2.45	2.5	2.55
18	2.2	2.3	2.75	......	2.40	3.9	2.8	4.0	2.5	2.45	2.5	2.5
19	2.2	2.3	2.6	......	2.35	3.9	2.85	4.4	2.45	2.45	2.5	2.48
20	2.2	2.3	2.55	......	2.35	3.8	2.8	4.5	2.40	2.45	2.5	2.45
21	2.25	2.35	2.55	......	2.35	3.8	2.8	4.3	2.40	2.45	2.5	2.45
22	2.25	2.35	2.55	3.3	2.30	4.0	2.8	4.0	2.40	2.5	2.5	2.45
23	2.25	2.4	2.5	3.0	2.30	4.0	2.75	3.7	2.40	2.5	2.5	2.45
24	2.25	2.4	2.5	2.85	2.30	4.2	2.9	3.6	2.40	2.5	2.5	2.45
25	2.25	2.4	2.45	2.7	2.30	4.1	3.1	3.5	2.5	2.5	2.5	2.48
26	2.25	2.5	2.45	2.6	2.25	3.9	3.35	3.5	2.45	2.5	2.5	2.48
27	2.25	2.55	2.45	2.5	2.25	3.7	3.2	3.6	2.45	2.5	2.5	2.48
28	2.25	2.55	2.45	2.40	2.25	3.6	3.1	3.7	2.45	2.5	2.5	2.48
29	2.25	2.6	2.45	2.40	......	3.6	2.95	3.7	2.45	2.5	2.5	2.48
30	2.3	2.8	2.45	2.40	......	3.6	2.9	3.6	2.45	2.5	2.5	2.48
31	2.3	......	2.45	2.40	......	3.5	......	3.4	......	2.5	2.5	......

Daily discharge, in second-feet, of Umatilla River near Umatilla, Oreg., for the year ending Sept., 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	49	49	270	79	79	49	770	270	580	79	90	90
2	49	58	270	79	90	58	995	270	495	79	90	90
3	49	58	415	79	90	58	1,380	270	415	79	90	90
4	49	68	538	79	105	68	1,520	270	270	90	90	90
5	49	68	670	79	120	210	1,240	270	210	90	90	105
6	49	68	770	79	120	580	1,120	340	160	90	90	105
7	49	68	880	79	140	770	770	340	120	90	90	105
8	49	58	880	90	140	1,120	495	270	68	90	90	105
9	49	58	770	105	140	1,520	340	210	49	90	90	105
10	42	58	770	140	120	1,740	340	185	49	79	90	105
11	42	49	720	160	90	1,820	270	160	49	68	90	105
12	58	49	625	185	90	1,520	415	140	49	68	90	105
13	58	58	495	210	79	1,380	415	140	49	68	90	105
14	42	58	495	210	79	1,120	340	120	90	68	90	105
15	42	49	415	280	79	770	340	160	90	68	90	105
16	49	49	340	345	68	770	270	160	90	79	90	105
17	42	49	270	415	68	995	210	1,240	90	79	90	105
18	34	49	185	448	68	1,240	210	1,380	90	79	90	90
19	34	49	120	481	58	1,240	240	1,970	79	79	90	86
20	34	49	105	514	58	1,120	210	2,130	68	79	90	79
21	42	58	105	547	58	1,120	210	1,820	68	79	90	79
22	42	58	105	580	49	1,380	210	1,380	68	90	90	79
23	42	68	90	340	49	1,380	185	995	68	90	90	79
24	42	68	90	240	49	1,660	270	880	68	90	90	79
25	42	68	79	160	49	1,520	415	770	90	90	90	86
26	48	90	79	120	42	1,240	625	770	79	90	90	86
27	42	105	79	90	42	995	495	880	79	90	90	86
28	42	105	79	68	42	880	415	995	79	90	90	86
29	42	120	79	68	....	880	305	995	79	90	90	86
30	49	210	79	68	....	880	270	880	79	90	90	86
31	49	....	79	68	....	770	....	670	....	90	90	....

NOTE.—Discharge determined from a well-defined rating curve.

Monthly discharge of Umatilla River near Umatilla, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	58	42	45.0	2,770	A.
November	210	49	69.0	4,110	A.
December	880	79	353	21,700	A.
January	580	68	209	12,900	B.
February	140	42	80.8	4,490	A.
March	1,820	49	995	61,200	A.
April	1,520	185	510	30,300	A.
May	2,130	120	688	42,300	A.
June	580	49	131	7,800	A.
July	90	68	82.9	5,100	A.
August	90	90	90.0	5,530	A.
September	105	79	93.7	5,580	A.
The year	2,130	42	281	204,000	

JOHN DAY RIVER NEAR DAYVILLE, OREG.

Location.—In sec. 4, T. 13 S., R. 27 E., about 3 miles above Dayville and the mouth of South Fork, at a private wagon bridge.

Records available.—November 23, 1908, to September 30, 1911.

Drainage area.—1,000 square miles.

Gage.—Vertical staff.

Channel.—Sand and gravel. Probably slightly shifting. Banks low below bridge and river overflows at about 3 feet gage height.

Discharge measurements.—Made from the private wagon bridge to which gage is attached, or at low water by wading.

Winter flow.—Affected by ice for short periods in winter.

Diversions.—Many private ditches take water from this river above station; amount of diversion unknown.

Accuracy.—Results good.

Discharge measurements of John Day River near Dayville, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-feet.*	1911.		*Feet.*	*Sec.-feet.*
Oct. 25	R. W. Davenport......	0.18	105	July 27	R. W. Davenport......	−0.58	5.7

Daily gage height, in feet, of John Day River near Dayville, Oreg., for the year ending Sept. 30, 1911.

[K. F. MacRae, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	−0.2	0.2	1.1	0.5	1.1	0.40	2.4	1.2	1.2	1.4	−0.30	−0.45
2	.0	.2	1.0	.5	.9	.48	2.4	1.15	1.5	1.3	− .30	− .40
3	+ .05	.2	1.5	.55	.5	.55	2.3	1.2	1.6	1.05	− .25	− .45
4	.2	.2	2.0	.5	.6	.7	2.1	1.2	1.6	.95	− .20	− .48
5	.2	.2	1.6	.5	.75	.9	2.0	1.2	1.6	.9	− .15	− .45
6	.15	.2	1.3	.5	.8	.9	1.8	1.4	1.6	.8	− .15	+ .10
7	.05	.25	1.1	.55	.6	2.3	1.7	1.3	1.7	.6	− .13	− .19
8	.1	.3	1.05	.6	.5	2.4	1.6	1.3	1.6	.55	− .15	− .15
9	.1	.4	1.3	.6	.5	2.2	1.6	1.3	1.6	.5	− .20	− .10
10	.1	.4	1.05	.6	.6	1.8	1.6	1.3	1.4	.40	− .20	− .12
11	.15	.4	1.0	.5	.7	1.8	1.5	1.2	1.6	.30	− .30	− .05
12	.15	.5	1.0	.42	.5	1.9	1.4	1.2	1.6	.20	− .30	− .02
13	.15	.5	.9	.4	.6	1.9	1.4	1.3	1.9	.0	− .35	.0
14	.15	.45	.9	.38	.5	1.9	1.4	1.25	1.9	− .10	− .40	− .05
15	.15	.3	.8	.48	.4	2.2	1.3	1.2	1.6	− .20	− .40	− .03
16	.15	.3	.8	.5	.4	2.3	1.4	1.4	1.6	− .35	− .40	− .05
17	.2	.3	.8	.5	.5	2.4	1.2	1.5	1.45	− .40	− .45	.0
18	.2	.3	.8	.5	.65	2.5	1.2	1.6	1.45	− .45	− .45	.0
19	.2	.4	.65	.5	.65	2.4	1.3	1.6	1.4	− .45	− .45	+ .05
20	.3	.4	.65	.6	.6	2.6	1.3	1.5	1.2	− .50	− .45	.05
21	.3	.4	.65	.42	.5	2.8	1.3	1.5	1.0	− .50	− .50	.10
22	.3	.7	.5	.4	.6	2.8	1.2	1.45	.9	− .55	− .50	.0
23	.25	.7	.7	.24	.5	3.0	1.3	1.4	.9	− .58	− .50	.0
24	.2	.85	.7	.4	.4	3.0	1.3	1.45	1.0	− .60	− .50	.0
25	.2	.75	.7	.6	.6	2.6	1.4	1.4	.9	− .64	− .50	.0
26	.2	.7	.65	.55	.48	2.2	1.6	1.4	.8	− .60	− .45	.0
27	.2	.65	.65	.5	.5	2.0	1.6	1.4	1.25	− .60	− .45	.05
28	.2	.9	.55	.5	.38	2.0	1.5	1.3	1.5	− .40	− .45	.0
29	.2	1.3	.5	.5	......	2.0	1.4	1.2	1.4	− .40	− .50	.05
30	.2	1.4	.6	.5	......	2.0	1.3	.9	1.6	− .40	− .50	.05
31	.2	......	.6	1.1	......	2.2	......	.9	......	− .30	− .45	......

NOTE.—A little floating ice reported occasionally; gage heights not seriously affected.

Daily discharge, in second-feet, of John Day River near Dayville, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	50	110	302	166	302	146	618	292	292	340	23	12
2	76	110	278	166	254	162	618	280	366	316	23	15
3	84	110	400	176	166	176	588	292	392	257	28	12
4	110	110	532	166	186	208	528	292	392	235	33	10
5	110	110	426	166	219	254	500	292	392	224	39	12
6	101	110	350	166	230	254	444	340	392	202	39	72
7	84	119	302	176	186	618	418	316	418	162	41	45
8	92	128	290	186	166	648	392	316	392	152	39	39
9	92	146	350	186	166	588	392	316	392	142	33	45
10	92	146	290	186	186	478	392	316	340	124	33	43
11	101	146	278	166	208	478	366	292	392	106	23	52
12	101	166	278	150	166	504	340	292	392	88	23	55
13	101	166	254	146	186	504	340	316	472	58	19	58
14	101	156	254	142	166	504	340	304	472	45	15	52
15	101	128	230	162	146	588	316	292	392	33	15	54
16	101	128	230	166	146	618	340	340	392	19	15	52
17	110	128	230	166	166	648	292	366	353	15	12	58
18	110	128	230	166	197	678	292	392	353	12	12	58
19	110	146	197	166	197	648	316	392	340	12	12	65
20	128	146	197	186	186	708	316	366	292	9	12	65
21	128	146	197	150	166	772	316	366	246	9	9	72
22	128	208	166	146	186	772	292	353	224	7	9	58
23	119	208	208	117	166	840	316	340	224	6	9	58
24	110	242	208	146	146	830	316	353	246	5	9	58
25	110	219	208	186	186	682	340	340	224	4	9	58
26	110	208	197	176	162	558	392	340	202	5	12	58
27	110	197	197	166	166	500	392	340	304	5	12	65
28	110	254	176	166	142	500	366	316	366	15	12	58
29	110	350	166	166	....	500	340	292	340	15	9	65
30	110	374	186	166	....	500	316	224	392	15	9	65
31	110	....	186	302	....	558	....	224	....	23	12	....

NOTE.—Discharge determined from two fairly well defined rating curves.

Monthly discharge of John Day River near Dayville, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	128	50	104	6,400	A.
November	374	110	168	10,000	A.
December	532	166	258	15,900	B.
January	302	117	169	10,400	A.
February	302	142	184	10,200	A.
March	840	146	530	32,600	B.
April	618	292	384	22,800	A.
May	392	224	319	19,600	A.
June	472	202	346	20,600	A.
July	340	4	85.8	5,280	A.
August	41	9	19.4	1,190	B.
September	72	10	49.6	2,950	B.
The year	840	4	218	158,000	

JOHN DAY RIVER AT McDONALD, OREG.

Location.—In sec. 11, T. 1 N., R. 19 E., 18 miles southwest of Arlington, half a mile below mouth of Rock Creek, 16 miles above junction with Columbia River.

Records available.—December 16, 1904, to September 30, 1911.

Drainage area.—7,800 square miles.

Gage.—Inclined staff in two sections on left bank, 183 feet above ferry cable.

Channel.—Clean gravel and sand; shifts slightly. Banks high. One channel at all stages.

Discharge measurements.—Made from cable and car.

Winter flow.—Affected by ice for short periods.

Diversions.—Large part of natural low-water flow of stream diverted in the upper John Day Valley for irrigation.

Accuracy.—Results excellent, except for uncertainty as to time of shift in channel, assumed to have occurred in March, 1910.

No discharge measurements made during the year.

Daily gage height, in feet, of John Day River at McDonald, Oreg., for the year ending Sept. 30, 1911.

[William Murray, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.35	1.6	2.6	2.1	2.1	2.0	4.8	3.8	3.4	2.85	1.3	1.05
2	1.35	1.6	2.95	2.1	2.1	2.0	5.0	3.7	3.4	2.9	1.3	1.05
3	1.35	1.6	2.7	2.0	2.4	1.9	5.0	3.6	3.6	2.8	1.3	1.05
4	1.4	1.6	2.75	2.0	2.3	2.0	4.8	3.7	3.7	2.7	1.3	1.08
5	1.4	1.6	2.75	2.0	2.2	2.1	4.6	3.8	3.7	2.55	1.3	1.45
6	1.4	1.6	3.6	1.95	2.05	2.2	4.4	3.8	3.7	2.5	1.25	1.3
7	1.4	1.6	3.0	1.95	2.1	2.5	4.0	4.0	3.6	2.5	1.2	1.3
8	1.4	1.6	2.9	2.0	2.2	3.5	3.8	4.0	3.4	2.4	1.15	1.4
9	1.6	1.6	2.7	2.0	2.2	4.5	3.8	3.8	3.45	2.3	1.1	1.4
10	1.6	1.65	2.8	2.1	2.1	3.7	3.7	3.8	3.4	2.2	1.3	1.4
11	1.55	1.7	2.7	2.05	2.1	3.5	3.8	3.7	3.3	2.1	1.2	1.8
12	1.5	1.7	2.7	2.05	2.1	3.35	3.7	3.8	3.2	2.0	1.2	1.55
13	1.5	1.75	2.6	2.0	2.2	3.35	3.6	3.5	3.25	1.9	1.2	1.5
14	1.5	1.8	2.7	1.9	2.2	3.25	3.6	3.4	3.8	1.8	1.15	1.4
15	1.5	1.9	2.6	1.8	2.0	3.45	3.4	3.6	4.2	1.8	1.15	1.4
16	1.5	1.9	2.5	1.7	2.1	3.7	3.35	3.5	3.6	1.8	1.15	1.4
17	1.5	1.9	2.3	1.95	2.1	3.9	3.3	3.4	3.4	1.7	1.1	1.4
18	1.5	1.85	2.2	2.0	2.0	4.2	3.3	3.6	3.2	1.7	1.1	1.4
19	1.5	1.75	2.4	2.2	2.0	4.4	3.3	3.8	3.05	1.65	1.1	1.4
20	1.5	1.75	2.3	2.0	2.0	4.5	3.4	4.0	2.95	1.6	1.1	1.35
21	1.55	1.7	2.3	2.2	2.1	4.8	3.35	4.0	2.85	1.55	1.1	1.35
22	1.55	1.7	2.15	2.25	2.1	5.2	3.3	4.0	2.8	1.5	1.1	1.35
23	1.55	1.8	2.0	2.3	2.0	5.4	3.4	3.9	2.7	1.5	1.1	1.35
24	1.6	1.85	2.05	2.15	2.0	5.8	3.6	3.8	2.7	1.5	1.1	1.4
25	1.6	2.0	2.1	2.0	2.0	5.8	3.8	3.8	2.7	1.45	1.1	1.4
26	1.6	2.1	2.1	2.0	2.0	5.0	4.0	3.8	2.6	1.4	1.1	1.4
27	1.55	2.2	2.2	1.9	2.0	4.7	4.2	3.7	2.7	1.4	1.1	1.4
28	1.55	2.1	2.2	2.0	2.0	4.3	4.2	3.7	2.7	1.4	1.1	1.4
29	1.55	2.1	2.1	2.0	......	4.2	4.2	3.6	2.6	1.4	1.1	1.4
30	1.6	2.45	2.1	2.0	......	4.1	4.0	3.5	2.9	1.35	1.1	1.4
31	1.6	......	2.05	2.0	......	4.4	......	3.4	......	1.3	1.1	......

NOTE.—Ice running Jan. 13, 15 to 18, and 23, 1911; gage heights not seriously affected.

Daily discharge, in second-feet, of John Day River at McDonald, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	178	310	1,200	700	700	610	5,260	3,060	2,360	1,530	155	75
2	178	310	1,670	700	700	610	5,760	2,880	2,360	1,600	155	75
3	178	310	1,320	610	980	525	5,760	2,700	2,700	1,460	155	75
4	200	310	1,390	610	880	610	5,260	2,880	2,880	1,320	155	82
5	200	310	1,390	610	790	700	4,780	3,060	2,880	1,140	155	226
6	200	310	2,700	568	655	790	4,310	3,060	2,880	1,080	137	155
7	200	310	1,740	568	700	1,080	3,450	3,450	2,700	1,080	119	155
8	200	310	1,600	610	790	2,530	3,060	3,450	2,360	980	103	200
9	310	310	1,320	610	790	4,540	3,060	3,060	2,440	880	87	200
10	310	342	1,460	700	700	2,880	2,880	3,060	2,360	790	155	200
11	281	375	1,320	655	700	2,530	3,060	2,880	2,200	700	119	447
12	252	375	1,320	655	700	2,280	2,880	3,060	2,040	610	119	281
13	252	411	1,200	610	790	2,280	2,700	2,530	2,120	525	119	252
14	252	447	1,320	525	790	2,120	2,700	2,530	3,060	447	103	200
15	252	525	1,200	447	610	2,440	2,360	2,700	3,860	447	103	200
16	252	525	1,080	375	700	2,880	2,280	2,530	2,700	447	103	200
17	252	525	880	568	700	3,250	2,200	2,360	2,360	375	87	200
18	252	486	790	610	610	3,860	2,200	2,700	2,040	375	87	200
19	252	411	980	790	610	4,310	2,200	3,060	1,820	342	87	200
20	252	411	880	610	610	4,540	2,360	3,450	1,670	310	87	177
21	281	375	880	790	700	5,260	2,280	3,450	1,530	281	87	177
22	281	375	745	835	700	6,270	2,200	3,450	1,460	252	87	177
23	281	447	610	880	610	6,800	2,360	3,250	1,320	252	87	177
24	310	486	655	745	610	7,910	2,700	3,060	1,320	252	87	200
25	310	610	700	610	610	7,910	3,060	3,060	1,320	226	87	200
26	310	700	700	610	610	5,760	3,450	3,060	1,200	200	87	200
27	281	790	790	525	610	5,020	3,860	2,880	1,320	200	87	200
28	281	700	790	610	610	4,080	3,860	2,880	1,320	200	87	200
29	281	700	700	610	....	3,860	3,860	2,700	1,200	200	87	200
30	310	1,030	700	610	....	3,650	3,450	2,530	1,600	177	87	200
31	310	....	655	610	....	4,310	....	2,360	....	155	87	....

NOTE.—Discharge determined from a fairly well defined rating curve. Discharge figures for Oct. 1 to Dec. 31, 1910, supersede those published in Water-Supply Paper 292, page 464.

Monthly discharge of John Day River at McDonald, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	310	178	256	15,700	B.
November	1,030	310	461	27,400	B.
December	2,700	610	1,120	68,900	B.
January	880	375	631	38. 800	B.
February	980	610	699	38,800	B.
March	7,910	525	3,430	211,000	B.
April	5,760	2,200	3,320	198,000	B.
May	3,450	2,360	2,940	181,000	B.
June	3,860	1,200	2,110	126,000	B.
July	1,600	155	608	37,400	B.
August	155	87	108	6,640	B.
September	447	75	191	11,400	B.
The year	7,910	75	1,330	961,000	

SOUTH FORK OF JOHN DAY RIVER AT DAYVILLE, OREG.

Location.—In sec. 7, T. 13 S., R. 27 E., about half a mile above the highway bridge in Dayville, and 1 mile above the mouth.

Records available.—November 21, 1908, to September 30, 1911.

Drainage area.—600 square miles.

Gage.—Vertical staff spiked to alder tree on left bank; datum unchanged.

Channel.—Stones and gravel; apparently permanent.

Discharge measurements.—Made from car and cable just below the gage or, at low water, by wading.

Winter flow.—Seldom affected by ice.

Diversions.—Dayville ditch carries water around the gage; records of this diversion available.

Accuracy.—Record excellent except short periods during which ice is present.

Discharge measurements of South Fork of John Day River at Dayville, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
1910. Oct. 25	R. W. Davenport......	0.19	22	1911. July 27	R. W. Davenport......	0.08	17.7

Daily gage height, in feet, of South Fork of John Day River at Dayville, Oreg., for the year ending Sept. 30, 1911.

[J. C. Martin, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.12	0.18	1.00	0.48	0.62	0.35	2.4	1.26	0.80	0.60	0.00	—0.10
2	.12	.19	.95	.45	.70	.40	2.3	1.22	.80	.53	.00	— .10
3	.13	.19	2.03	.45	.42	.45	2.25	1.34	.80	.50	.00	— .10
4	.17	.19	2.03	.45	.46	.55	2.0	1.32	.80	.50	.00	— .03
5	.15	.19	1.00	.45	.59	.60	1.9	1.31	.78	.45	.02	.00
6	.15	.20	.92	.37	.60	.64	1.8	1.26	.75	.40	.02	+ .03
7	.15	.20	.85	.35	.50	1.44	1.7	1.19	.75	.40	.00	.05
8	.12	.25	.70	.42	.45	1.30	1.65	1.15	.72	.35	.00	.07
9	.12	.25	1.18	.42	.42	.98	1.55	1.18	.70	.30	.00	.07
10	.12	.25	.92	.42	.59	1.00	1.55	1.12	.69	.25	.00	.07
11	.12	.25	1.00	.42	.60	.95	1.5	1.09	.65	.22	.00	.07
12	.20	.26	1.04	.42	.57	.93	1.42	1.10	.62	.20	.00	.05
13	.20	.26	.90	.42	.50	1.04	1.42	1.12	.70	.18	.00	.04
14	.19	.25	.70	.42	.42	1.28	1.40	1.05	.65	.15	—.02	.04
15	.18	.25	.67	.42	.40	1.5	1.30	1.03	.62	.15	.00	.02
16	.18	.26	.60	.40	.40	1.7	1.32	1.02	.62	.12	—.01	.02
17	.18	.26	.60	.40	.40	1.85	1.29	1.20	.58	.10	—.01	.02
18	.18	.29	.50	.40	.40	1.9	1.30	1.18	.52	.10	—.01	.03
19	.18	.26	.40	.41	.42	1.85	1.30	1.20	.50	.10	—.02	.02
20	.18	.28	.40	.50	.48	2.6	1.25	1.19	.48	.24	—.02	.01
21	.20	.29	.50	.45	.48	2.45	1.26	1.18	.45	.24	—.02	.03
22	.20	.30	.51	.45	.50	2.5	1.30	1.02	.45	.22	—.01	.02
23	.20	.42	.52	.41	.50	2.9	1.31	1.02	.42	.18	—.05	.02
24	.20	.50	.50	.42	.47	2.45	1.34	1.01	.50	.15	—.05	.05
25	.21	.45	.50	.44	.47	2.25	1.40	1.00	.48	.10	—.05	.05
26	.20	.42	.50	.44	.45	2.05	1.42	1.00	.46	.08	—.10	.10
27	.20	.45	.50	.44	.37	1.85	1.40	.99	.55	.05	—.10	.11
28	.18	.72	.50	.44	.32	1.8	1.38	.92	.68	.04	—.10	.12
29	.18	1.54	.50	.44	......	1.95	1.35	.90	.62	.01	—.10	.12
30	.18	1.30	.48	.49	......	2.15	1.30	.90	.65	.01	—.10	.12
31	.18	......	.48	.76	......	2.2	......	.81	......	.01	—.12	......

NOTE.—Slush ice reported occasionally. Jan. 12, 1911, ice on both shores. Gage heights not seriously affected.

Daily discharge, in second-feet, of South Fork of John Day River at Dayville, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	18	23	160	56	78	40	723	237	112	74	13	8
2	18	23	147	52	92	46	673	224	112	64	13	8
3	19	23	544	52	49	52	648	264	112	59	13	8
4	22	23	544	52	54	66	530	257	112	59	13	12
5	20	23	160	52	72	74	484	253	108	52	14	13
6	20	24	139	43	74	81	440	237	102	46	14	15
7	20	24	123	40	59	298	398	215	102	46	13	16
8	18	28	92	49	52	250	378	208	96	40	13	17
9	18	28	212	49	49	155	339	212	92	35	13	17
10	18	28	139	49	72	160	339	194	90	30	13	17
11	18	28	160	49	74	147	320	185	83	28	13	17
12	24	29	171	49	70	142	291	188	78	26	13	16
13	24	29	134	49	59	171	291	194	92	25	13	15
14	23	28	92	49	49	244	284	174	83	22	12	15
15	23	28	87	49	46	320	250	168	78	22	13	14
16	23	29	74	46	46	398	257	166	78	20	12	14
17	23	29	74	46	46	462	247	218	71	19	12	14
18	23	31	58	46	46	484	250	212	62	19	12	15
19	23	29	44	47	49	462	250	218	59	19	12	14
20	23	30	44	59	56	829	234	215	56	30	12	14
21	24	31	58	52	56	749	237	212	52	30	12	15
22	24	32	60	52	59	775	250	166	52	28	12	14
23	24	47	61	47	59	994	253	166	49	25	10	14
24	24	58	58	49	55	749	264	163	59	22	10	16
25	25	51	58	51	55	648	284	160	56	19	10	16
26	24	47	58	51	52	553	291	160	54	18	8	19
27	24	51	58	51	43	462	284	157	66	16	8	20
28	23	96	58	51	37	440	277	139	88	15	8	20
29	23	335	58	51	......	507	267	134	78	14	8	20
30	23	250	55	58	......	600	250	134	83	14	8	20
31	23	......	55	104	......	624	......	114	......	14	7	......

NOTE.—Discharge determined from a rating curve well defined between 20 and 1,200 second-feet.

Monthly discharge of South Fork of John Day River at Dayville, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	25	18	21.9	1,350	A.
November	335	23	51.2	3,050	A.
December	544	44	124	7,620	A.
January	104	40	51.6	3,170	A.
February	92	37	57.4	3,190	A.
March	994	40	387	23,800	A.
April	723	234	343	20,400	A.
May	264	114	192	11.800	A.
June	112	49	80.5	4,790	A.
July	74	14	30.6	1,880	A.
August	14	7	11.5	707	B.
September	20	8	15.1	898	B.
The year	944	7	114	82,700	

DAYVILLE DITCH AT DAYVILLE, OREG.

Location.—In sec. 7, T. 13 S., R. 27 E., directly opposite the gage on South Fork of John Day River, at Dayville.

Records available.—June 7, 1910, to September 30, 1911.

Gage.—Vertical staff.

Channel.—Gravel; practically permanent.

Discharge measurements.—Made by wading near the gage.

Accuracy.—Results fair.

Discharge measurements of Dayville ditch at Dayville, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
1910. Oct. 25	R. W. Davenport......	0.77	[a] 0.2	1911. July 27	R. W. Davenport......	1.24	2.0

[a] Discharge estimated.

Daily gage height, in feet, of Dayville ditch at Dayville, Oreg., for the year ending Sept. 30, 1911.

[J. C. Martin, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.78	0.77	1.20	0.78	0.77	......	0.80	0.90	1.31	0.85	1.28	1.24
2	.78	.77	1.18	.76	.77	......	.75	.85	1.32	.82	1.28	1.24
3	.76	.77	1.20	.76	.75	0.72	.98	.85	1.31	.85	1.28	1.22
4	.72	.77	1.19	.78	.75	.75	.90	1.00	1.30	.85	1.29	1.38
5	.72	.77	1.05	.78	.77	.78	.70	1.00	1.30	1.00	1.30	1.38
6	.72	.77	.78	.76	.77	......	.87	1.06	1.28	1.00	1.25	1.43
7	.72	.77	.75	.75	.77	......	1.10	1.08	1.28	1.00	1.20	1.45
8	.75	.78	.80	.78	.75	......	1.08	1.06	1.28	1.10	1.18	1.40
9	.75	.78	.82	.78	.75	......	1.12	1.05	1.28	1.20	1.16	1.15
10	.76	.78	.80	.78	.78	......	1.12	1.05	1.27	1.10	1.15	1.14
11	.75	.78	.80	.78	.78	......	1.10	1.08	.98	1.50	1.15	1.11
12	.75	.80	.83	.75	.78	......	.95	1.08	.95	1.46	1.10	1.10
13	.75	.80	.80	......	.76	......	.80	1.08	.62	1.48	1.09	1.10
14	.75	.78	.78	......	.75	......	.80	1.08	......	1.48	1.08	1.10
15	.76	.78	.76	.75	.75	......	.80	1.10	......	1.48	1.08	1.10
16	.75	.80	.70	.75	.75	......	.80	1.10	......	1.48	1.08	1.10
17	.75	.80	.65	.75	.72	......	.88	1.12	.88	1.35	1.02	1.08
18	.76	.80	.65	.75	.72	......	1.05	.85	1.09	1.37	1.01	1.08
19	.75	.80	.60	.75	.72	......	1.16	.85	1.09	1.37	.99	1.06
20	.75	.80	.76	.77	.75	......	1.20	.98	1.08	1.37	.99	1.06
21	.75	.81	.95	.75	.75	......	1.19	1.12	1.05	1.30	.99	1.06
22	.75	.81	.75	.75	.75	......	1.20	1.18	1.05	1.25	.99	1.05
23	.77	.80	.77	.75	.75	......	1.20	1.18	1.05	1.20	.90	1.06
24	.77	.76	.77	.75	.75	......	1.20	1.30	1.10	1.10	.90	1.05
25	.77	.76	.79	.75	.76	......	1.20	1.42	1.10	1.06	.90	1.05
26	.77	.75	.79	.75	.75	.80	1.16	1.42	.84	1.20	1.30	1.10
27	.77	.75	.79	.75	.75	.89	.70	1.36	1.08	1.22	1.26	1.11
28	.77	.80	.79	.75	......	.85	1.06	1.22	.85	1.28	1.28	1.11
28	.77	1.22	.79	.75	......	.98	.70	1.20	.85	1.22	1.28	1.11
30	.77	1.12	.78	.77	......	1.15	.90	1.20	.85	1.18	1.28	1.11
31	.77	......	.78	.79	......	1.02	......	1.28	......	1.18	1.28	......

NOTE.—Ditch was dry Mar. 6 to 25 and June 14 to 16, 1911.

Daily discharge, in second-feet, of Dayville ditch at Dayville, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.3	0.3	1.8	0.3	0.3	0.2	0.3	0.5	2.7	0.4	2.4	2.1
2	.3	.3	1.7	.3	.3	.2	.2	.4	2.8	.3	2.4	2.1
3	.3	.3	1.8	.3	.2	.2	.7	.4	2.7	.4	2.4	2.0
4	.2	.3	1.7	.3	.2	.2	.5	.8	2.6	.4	2.5	3.3
5	.2	.3	1.0	.3	.3	.3	.2	.8	2.6	.8	2.6	3.3
6	.2	.3	.3	.3	.3	.0	.4	1.0	2.4	.8	2.2	3.8
7	.2	.3	.2	.2	.3	.0	1.2	1.1	2.4	.8	1.8	4.0
8	.2	.3	.3	.3	.2	.0	1.1	1.0	2.4	1.2	1.7	3.5
9	.2	.3	.3	.3	.2	.0	1.3	1.0	2.4	1.8	1.6	1.5
10	.2	.3	.3	.3	.3	.0	1.3	1.0	2.4	1.2	1.5	1.4
11	.2	.3	.3	.3	.3	.0	1.2	1.1	.7	4.5	1.5	1.3
12	.2	.3	.4	.2	.3	.0	.6	1.1	.6	4.1	1.2	1.2
13	.2	.3	.3	.2	.3	.0	.3	1.1	.1	4.3	1.2	1.2
14	.2	.3	.3	.2	.2	.0	.3	1.1	.0	4.3	1.1	1.2
15	.2	.3	.2	.2	.2	.0	.3	1.2	.0	4.3	1.1	1.2
16	.2	.3	.2	.2	.2	.0	.3	1.2	.0	4.3	1.1	1.2
17	.2	.3	.2	.2	.2	.0	.5	1.3	.5	3.0	.9	1.1
18	.2	.3	.2	.2	.2	.0	1.0	.4	1.2	3.2	.8	1.1
19	.2	.3	.1	.2	.2	.0	1.6	.4	1.2	3.2	.8	1.0
20	.2	.3	.2	.3	.2	.0	1.8	.7	1.1	3.2	.8	1.0
21	.2	.3	.6	.2	.2	.0	1.7	1.3	1.0	2.6	.8	1.0
22	.2	.3	.2	.2	.2	.0	1.8	1.7	1.0	2.2	.8	1.0
23	.3	.3	.3	.2	.2	.0	1.8	1.7	1.0	1.8	.5	1.0
24	.3	.2	.3	.2	.2	.0	1.8	2.6	1.2	1.2	.5	1.0
25	.3	.2	.3	.2	.2	.0	1.8	3.7	1.2	1.0	.5	1.0
26	.3	.2	.3	.2	.2	.3	1.6	3.7	.4	1.8	2.6	1.2
27	.3	.2	.3	.2	.2	.5	.2	3.1	1.1	2.0	2.3	1.3
28	.3	.3	.3	.2	.2	.4	1.0	2.0	.4	2.4	2.4	1.3
29	.3	2.0	.3	.2	......	.7	.2	1.8	.4	2.0	2.4	1.3
30	.3	1.3	.3	.3	......	1.5	.5	1.8	.4	1.7	2.4	1.3
31	.3	......	.3	.3	......	.9	......	2.4	......	1.7	2.4	......

NOTE.—Discharge determined from a fairly well defined rating curve.

Monthly discharge of Dayville ditch at Dayville, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	0.3	0.2	0.24	14.8	B.
November	2.0	.2	.38	22.6	B.
December	1.8	.1	.49	30.1	B.
January	.3	.2	.24	14.8	B.
February	.3	.2	.23	12.8	B.
March	1.5	.0	.17	10.5	C.
April	1.8	.2	.92	54.7	B.
May	3.7	.4	1.40	86.1	A.
June	2.8	.0	1.30	77.4	A
July	4.5	.3	2.16	133	A.
August	2.6	.5	1.59	97.8	A.
September	4.0	1.0	1.66	98.8	A.
The year	4.5	0	.90	653	

ROCK CREEK AT ROCKCREEK, OREG.

Location.—In sec. 15, T. 1 N., R. 20 E., 6 miles above mouth of Rock Creek, just below Rockcreek station on Condon branch of Oregon-Washington Railroad & Navigation Co.'s line.

Records available.—February 25 to August 19, 1905; April 6 to October 21, 1911.

Drainage area.—About 630 square miles.

Gage.—Vertical staff attached to highway bridge.

Channel.—Gravel; shifting.

Discharge measurements.—Made from highway bridge or by wading near gage.

Diversions.—Small irrigation ditch diverts above the station.

Accuracy.—Records fair.

Discharge measurements of Rock Creek at Rockcreek, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 6	Charles Leidl	1.39	63.6
May 15	.....do	.20	3.1
Sept. 19	.....do	—.20	[a] .2

[a] Discharge estimated.

Daily gage height, in feet, of Rock Creek at Rockcreek, Oreg., for Apr. 6 to Oct. 21, 1911.

[Wm. Head, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1		0.35	—0.05	0.00	—0.15	—0.35	—0.10
2		.32	— .10	— .05	— .20	— .30	— .10
3		.32	— .10	— .05	— .20	— .30	— .10
4		.30	— .05	— .05	— .20	— .30	— .05
5		.30	— .05	.00	— .15	— .10	+ .05
6	1.39	.30	.00	— .05	— .15	— .05	.05
7		.30	— .05	— .10	— .20	— .10	.05
8		.25	— .05	— .10	— .20	— .10	.05
9	1.30	.20	— .10	— .10	— .20	— .05	.05
10	1.40	.20	— .10	— .10	— .20	— .05	.05
11	1.50	.30	— .10	— .05	— .25	— .10	.05
12	1.50	.35	— .05	— .05	— .25	— .10	.04
13	1.42	.40	— .05	— .10	— .25	— .10	.04
14	1.42	.35	— .10	— .10	— .25	— .15	.05
15	1.02	.20	— .05	— .15	— .25	— .15	.05
16	1.00	.35	— .05	— .15	— .20	— .15	.05
17	1.00	.40	— .10	— .15	— .20	— .20	.04
18	.95	.45	— .05	— .10	— .20	— .20	.04
19	.90	.45	— .10	— .10	— .20	— .25	.04
20	.85	.50	— .05	— .15	— .25	— .20	.05
21	.80	.45	— .05	— .15	— .25	— .20	.04
22	.80	.40	— .10	— .15	— .25	— .20	
23	.75	.35	.00	— .15	— .25	— .25	
24	.70	.30	.00	— .15	— .25	— .25	
25	.60	.20	.00	— .15	— .25	— .20	
26	.50	.10	— .05	— .20	— .20	— .20	
27	.50	.05	.00	— .15	— .25	— .20	
28	.40	.00	.00	— .20	— .25	— .20	
29	.40	.00	— .05	— .20	— .30	— .15	
30	.40	— .05	— .05	— .20	— .30	— .15	
31		— .05		— .15	— .35		

Daily discharge, in second-feet, of Rock Creek at Rockcreek, Oreg., for Apr. 6 to Oct. 21, 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	....	6.0	0.9	1.2	0.4	0.0	0.6
2	....	5.3	.6	.9	.2	.1	.6
3	....	5.3	.6	.9	.2	.1	.6
4	....	4.8	.9	.9	.2	.1	.9
5	....	4.8	.9	1.2	.4	.6	1.6
6	63	4.8	1.2	.9	.4	.9	1.6
7	61	4.8	.9	.6	.2	.6	1.6
8	58	4.0	.9	.6	.2	.6	1.6
9	56	3.1	.6	.6	.2	.9	1.6
10	64	3.1	.6	.6	.2	.9	1.6
11	73	4.8	.6	.9	.2	.6	1.6
12	73	6.0	.9	.9	.2	.6	1.5
13	66	7.3	.9	.6	.2	.6	1.5
14	66	6.0	.6	.6	.2	.4	1.6
15	36	3.1	.9	.4	.2	.4	1.6
16	35	6.0	.9	.4	.2	.4	1.6
17	35	7.3	.6	.4	.2	.2	1.5
18	32	8.9	.9	.6	.2	.2	1.5
19	29	8.9	.6	.6	.2	.2	1.5
20	26	10	.9	.4	.2	.2	1.6
21	24	8.9	.9	.4	.2	.2	1.5
22	24	7.3	.6	.4	.2	.2	....
23	21	6.0	1.2	.4	.2	.2	....
24	19	4.8	1.2	.4	.2	.2	....
25	14	3.1	1.2	.4	.2	.2	....
26	10	2.0	.9	.2	.2	.2	....
27	10	1.6	1.2	.4	.2	.2	....
28	7.3	1.2	1.2	.2	.2	.2	....
29	7.3	1.2	.9	.2	.1	.4	....
30	7.3	.9	.9	.2	.1	.4	....
31	....	.9	....	.4	.0	....	....

NOTE.—Discharge determined from a fairly well-defined rating curve.

Monthly discharge of Rock Creek at Rockcreek, Oreg., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April 6-30	73	7.3	36.7	1,820	B.
May	10	.9	4.91	302	B.
June	1.2	.6	.87	51.8	B.
July	1.2	.2	.57	35.0	B.
August	.4	.0	.21	12.9	B.
September	.9	.0	.37	22.0	B.
October 1-21	1.6	.6	1.40	58.3	B.
The period	....	....	....	2,300	

DESCHUTES RIVER NEAR LAPINE, OREG.

Location.—At the wagon bridge at the former town of Rosland, in sec. 2, T. 22 S., R. 10 E., 1½ miles above the Rosland ranger station; about 1½ miles north of Lapine.

Records available.—September 22, 1910, to August 31, 1911; incomplete.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Sand and clay; not likely to shift.

Discharge measurements.—Made from the highway bridge or by wading.

Winter flow.—Materially affected by ice.

Accuracy.—Open-channel curve well defined.

Cooperation.—Gage readings furnished by the United States Forest Service.

Discharge measurements of Deschutes River near Lapine, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Nov. 19	R. W. Davenport	1.32	154	May 15	R. W. Davenport	2.89	395
26[a]	do	1.85	224				

[a] Some ice running.

Daily gage height, in feet, of Deschutes River near Lapine, Oreg., for Sept. 22, 1910, to Aug. 31, 1911.

Day.	Sept.	Oct.	Nov.	Dec.	Jan.	Mar.	Apr.	Aug.
1		0.99	1.03	2.72			2.10	
2		1.00	1.03	2.80				1.30
3		1.14	1.01	2.74	1.45			1.30
4		1.25		2.83	1.50		2.20	1.30
5		1.59		2.79				1.35
7		1.45					2.00	1.30
7		1.38	1.00	2.28	1.50			1.20
8		1.29	1.29				2.00	1.20
9		1.24	2.00					1.30
10		1.19	1.90					1.20
11		1.15	1.80					1.00
12		1.25	1.80					1.00
13		1.29	1.60					
14			1.45					1.00
15			1.40					1.06
16			1.27					1.06
17			1.25					1.05
18			1.38					1.05
19			1.32					1.06
20			1.30				2.10	
21			1.50	1.65				1.06
22	1.14	1.13	1.78	1.65			2.40	1.06
23	1.10		1.94	1.60		1.80		1.06
24	1.06	1.09	2.50	1.50				
25	1.03	1.09	1.68	1.70		1.80		
26	1.02	1.08					3.10	
27	1.00	1.08		1.48		1.70	3.20	
28		1.06	1.78	1.45		1.60		1.10
29		1.05	1.80	1.40				1.10
30	.98	1.04	2.35	1.40		1.90		1.10
31		1.04						1.10

Daily discharge, in second-feet, of Deschutes River near Lapine, Oreg., for Sept. 22, 1910, to Aug. 31, 1911.

Day.	Sept.	Oct.	Nov.	Dec.	Jan.	Mar.	Apr.	Aug.
1	....	113	118	367	....	....	266	152
2	....	114	118	381	....	....	271	152
3	....	131	115	371	172	....	277	152
4	....	146	115	386	179	....	282	152
5	....	192	114	378	....	....	266	158
6	....	172	114	336	....	....	251	152
7	....	162	114	295	179	....	240	139
8	....	151	151	288	....	....	251	139
9	....	144	251	280	....	....	260	152
10	....	138	236	272	....	....	270	139
11	....	132	221	264	....	....	270	114
12	....	146	221	258	....	....	260	114
13	....	151	193	252	....	....	240	114
14	....	148	172	246	....	....	230	114
15	....	146	165	238	....	....	220	120
16	....	144	148	232	....	....	218	120
17	....	141	146	226	....	....	226	120
18	....	139	162	220	....	....	245	120
19	....	136	155	212	....	....	257	120
20	....	134.	152	206	....	....	266	120
21	....	132	179	200	....	....	270	120
22	131	130	218	200	....	....	314	120
23	126	128	242	193	....	221	344	120
24	121	125	330	179	....	221	372	12'
25	118	125	204	207	....	221	402	123
26	116	124	208	192	....	....	432	123
27	114	124	213	176	....	207	449	125
28	....	121	218	172	....	193	456	126
29	....	120	221	165	....	....	463	126
30	112	119	306	165	....	236	470	126
31	....	119	....	165	....	251	....	126

NOTE.—Discharge determined from a well-defined rating curve. Discharge for days in October, November, December, April, and August, when no gage height was reported, estimated by hydrograph comparison with the records at Allen's ranch.

Monthly discharge of Deschutes River near Lapine, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	192	113	137	8,420	A.
November	330	114	184	10.900	A.
December	386	165	255	15,700	A.
April	470	218	301	17,900	A.
August	158	114	130	7,990	A.

DESCHUTES RIVER AT ALLEN'S RANCH, NEAR LAVA, OREG.

Location.—In the SW. ¼ SW. ¼ sec. 8, T. 20 S., R, 11 E., on C. B. Allen's ranch, about 1 mile north of Lava, Oreg., and about half a mile above the mouth of the West Fork of Deschutes River; 18 miles south of Bend.

Records available.—February 17, 1905, to September 30, 1911.

Drainage area.—About 720 square miles.

Gage.—Inclined staff on east bank of river; datum unchanged.

Channel.—Clay; considerable growth of weeds during summer months.

Discharge measurements.—Made from a cable about 50 feet below the gage.

Winter flow.—Gage heights rather seriously affected by ice during the winter months.

Accuracy.—Somewhat impaired by the weeds that grow in the vicinity of the station during the summer months and also by possible shifting of the channel.

Discharge measurements of Deschutes River at Allen's ranch, near Lava, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Nov. 17	R. W. Davenport......	5.52	153	Jan. 22[a]	R. W. Davenport......	5.94	149
18	.....do..................	5.59	162	May 16	.....do..................	6.80	424

[a] River frozen over. Ice about 1 inch thick.

Daily gage height, in feet, of Deschutes River at Allen's ranch, near Lava, Oreg., for the year ending Sept. 30, 1911.

[Mrs. C. B. Allen, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	5.4	5.3	6.15	5.75	6.1	6.0	6.0	6.9	6.7	6.8	5.55	5.25
2	5.4	5.3	6.6	5.8	6.15	5.95	6.1	6.8	6.8	6.7	5.55	5.3
3	5.55	5.3	7.0	5.75	6.15	5.95	6.2	6.8	7.1	6.6	5.5	5.3
4	5.6	5.3	7.1	5.7	6.1	6.0	6.25	6.9	7.3	6.6	5.5	5.35
5	5.65	5.3	6.75	5.75	6.1	6.0	6.25	6.9	7.3	6.5	5.5	5.45
6	5.8	5.3	6.6	5.7	6.15	6.15	6.1	6.9	7.3	6.45	5.45	5.5
7	5.8	5.4	6.4	5.65	6.1	6.2	6.0	7.0	7.4	6.4	5.45	5.5
8	5.65	5.55	6.35	5.65	6.1	6.2	6.0	7.0	7.4	6.35	5.45	5.5
9	5.6	5.6	6.35	5.7	6.05	6.2	6.1	7.0	7.3	6.3	5.45	5.5
10	5.6	5.95	6.35	5.75	6.0	6.15	6.15	7.0	7.2	6.25	5.45	5.55
11	5.6	6.0	6.3	5.8	6.0	6.15	6.2	7.0	7.2	6.2	5.45	5.5
12	5.6	5.9	6.25	5.9	6.1	6.0	6.1	7.0	7.2	6.15	5.45	5.5
13	5.6	5.85	6.25	5.8	6.1	5.9	6.0	6.8	7.2	6.1	5.4	5.45
14	5.6	5.7	6.15	5.85	6.05	5.8	6.0	6.8	7.2	6.1	5.45	5.45
15	5.6	5.6	6.1	5.8	6.05	5.65	5.9	6.8	7.3	6.1	5.5	5.4
16	5.55	5.5	6.0	5.8	6.05	5.9	5.9	6.8	7.4	6.05	5.5	5.4
17	5.55	5.45	5.9	5.75	6.05	5.6	6.0	6.8	7.4	6.0	5.45	5.4
18	5.55	5.5	5.9	5.75	6.0	5.65	6.0	7.2	7.4	5.95	5.4	5.35
19	5.5	5.5	5.8	5.9	6.0	5.65	6.15	7.3	7.4	5.9	5.4	5.35
20	5.5	5.5	5.5	5.9	6.05	5.65	6.2	7.2	7.3	5.9	5.4	5.35
21	5.45	5.55	5.6	5.9	6.05	5.75	6.2	7.2	7.2	5.85	5.4	5.3
22	5.45	5.7	5.6	5.9	6.05	5.85	6.2	7.1	7.1	5.85	5.35	5.3
23	5.45	6.05	5.7	6.4	6.0	5.95	6.35	6.9	7.0	5.8	5.35	5.3
24	5.45	6.15	5.8	6.6	6.0	5.95	6.45	6.8	7.0	5.75	5.3	5.3
25	5.45	6.35	5.6	5.9	6.0	5.95	6.6	6.8	7.0	5.75	5.3	5.3
26	5.4	6.1	5.65	6.0	6.0	5.9	6.6	6.8	7.0	5.75	5.3	5.5
27	5.35	5.9	5.7	5.95	6.0	5.85	6.8	6.8	6.9	5.7	5.3	5.6
28	5.3	5.6	5.7	5.95	6.0	5.75	6.8	6.8	7.0	5.7	5.25	5.7
29	5.3	6.0	5.6	6.0	....	5.75	6.9	6.8	7.0	5.65	5.25	5.6
30	5.3	6.05	5.7	6.05	....	5.8	6.9	6.8	6.8	5.6	5.25	5.5
31	5.3	....	5.65	6.05	....	5.9	....	6.8	....	5.6	5.2	....

NOTE.—River frozen from some time in December, 1910, until about Mar. 15, 1911.

Daily discharge, in second-feet, of Deschutes River at Allen's ranch, near Lava, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	125	115	232	175	205	410	355	382	141	110
2	125	115	329	175	223	382	382	355	141	115
3	141	115	439	175	242	382	468	329	135	115
4	147	115	468	175	252	410	528	329	135	120
5	154	115	368	175	252	410	528	305	135	130
6	173	115	329	175	223	410	528	294	130	135
7	173	125	283	175	205	439	559	283	130	135
8	154	141	272	175	205	439	559	272	130	135
9	147	147	272	175	223	439	528	262	130	135
10	147	196	272	175	232	439	498	252	130	141
11	147	205	262	175	242	439	498	242	130	135
12	147	188	252	175	223	439	498	232	130	135
13	147	180	252	175	205	382	498	223	125	130
14	147	160	232	173	205	382	498	223	130	130
15	147	147	223	154	188	382	528	223	135	125
16	141	135	205	188	188	382	559	214	135	125
17	141	130	188	147	205	382	559	206	130	125
18	141	135	188	154	205	498	559	196	125	120
19	135	135	173	154	232	528	559	188	125	120
20	135	135	135	154	242	498	528	188	125	120
21	130	141	147	166	242	498	498	180	125	115
22	130	160	147	180	242	468	468	180	120	115
23	130	214	160	196	272	410	439	173	120	115
24	130	232	173	196	294	382	439	166	115	115
25	130	272	147	196	329	382	439	166	115	115
26	125	223	154	188	329	382	439	166	115	135
27	120	188	160	180	382	382	410	160	115	147
28	115	147	160	166	382	382	439	160	110	160
29	115	205	147	166	410	382	439	154	110	147
30	115	214	160	173	410	382	382	147	110	135
31	115	....	154	188	....	382	....	147	106	....

NOTE.—Discharge determined from a poorly defined rating curve. Discharge for January and February and for Mar. 1 to 13, estimated from discharge measurement and studies of records at adjacent stations.

Monthly discharge of Deschutes River at Allen's ranch, near Lava, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	173	115	138	8,480	C.
November	272	115	162	9,640	C.
December	468	135	229	14,100	C.
January	....	....	150	9,220	C.
February	....	....	170	9,440	D.
March	196	147	174	10,700	C.
April	410	188	256	15,200	C.
May	528	382	416	25,600	C.
June	559	355	487	29,000	C.
July	382	147	226	13,900	C.
August	141	106	125	7,690	D.
September	160	110	128	7,620	D.
The year	....	....	222	161,000	

DESCHUTES RIVER AT BENHAM FALLS, NEAR BEND, OREG.

Location.—In the NE. ¼ sec. 16, T. 19 S., R. 11 E., about 250 yards above Benham Falls, and 14 miles above Bend; above the more important irrigation diversions from Deschutes River, and just below the dam site of the proposed Benham Falls reservoir.

Records available.—March 30, 1909, to September 30, 1911. Records at this station are directly comparable with those at West's ranch, 7 miles upstream by river, July 21, 1906, to February 20, 1909.

Drainage area.—Indeterminate.

Gage.—Vertical staff driven into edge of stream on right bank. Maintenance of gage datum at times somewhat uncertain.

Channel.—Sandy; may shift slightly. Considerable growth of weeds along the right bank.

Discharge measurements.—Made from car and cable.

Winter flow.—Not materially affected by ice.

Diversions.—The diversion of water by some small ditches that are taken out above this station has no appreciable effect on discharge.

Accuracy.—Rating curve well defined. Some uncertainty as to effect of weeds. As this record has been used as basis for all studies of the possibilities of power and irrigation development on Deschutes River between West Fork and Crooked and Metolius rivers, it has been extended by the aid of the records at Bend and West's ranch from January 1, 1905, to September 30, 1911.

Cooperation.—Station maintained in cooperation with the Central Oregon Irrigation Co.

Discharge measurements of Deschutes River at Benham Falls, near Bend, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		Feet.	Sec.-ft.	1911.		Feet.	Sec.-ft.
Nov. 17	R. W. Davenport	3.95	1,430	May 17	R. W. Davenport	4.36	1,600
Dec. 27	.....do	3.94	1,440				

Daily gage height, in feet, of Deschutes River at Benham Falls, near Bend, Oreg., for the year ending Sept. 30, 1911.

[Joseph Zoll, observer.]

Day.	Oct.	Nov.	Dec.	Jan	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	4.0	3.9	4.15	3.9	3.9	3.6	4.1	4.3	4.2	4.2	3.9	3.8
2	4.0	3.9	4.30	4.0	3.9	3.7	4.1	4.3	4.2	......	3.9	3.8
3	4.0	3.9	4.45	4.0	3.8	3.7	4.2	4.3	4.3	4.2	3.9	3.8
4	4.05	3.9	4.45	3.9	3.8	3.7	4.2	4.3	4.4	4.2	3.9	3.8
5	4.05	3.9	4.40	3.9	3.8	......	4.2	4.3	4.4	4.2	3.9	3.9
6	4.1	3.9	4.35	3.9	3.8	3.8	4.1	4.3	4.4	4.2	3.9	3.9
7	4.05	3.95	4.30	3.9	3.8	3.8	4.1	4.3	4.4	4.1	3.9	3.9
8	4.05	4.0	4.25	3.9	3.8	3.8	4.1	4.3	4.4	4.1	3.8	3.9
9	4.0	4.0	4.25	4.0	3.8	3.8	4.1	4.4	4.4	4.1	3.8	3.9
10	4.0	4.05	4.25	4.0	3.8	3.8	4.2	4.3	4.4	4.1	3.8	3.9
11	4.0	4.1	4.22	3.9	3.8	3.8	4.2	4.3	4.4	4.1	3.8	3.9
12	4.0	4.1	4.22	3.9	3.8	3.8	4.1	4.4	4.4	4.0	3.8	3.9
13	4.0	4.05	4.20	3.9	3.8	3.8	4.0	4.3	4.4	4.0	3.8	3.9
14	4.0	4.0	4.18	3.9	3.8	3.8	4.0	4.3	4.4	4.0	3.8	3.8
15	4.0	4.0	4.17	3.9	3.8	3.8	4.0	4.3	4.4	4.0	3.9	3.8
16	4.0	3.95	4.10	3.9	3.8	3.8	......	4.3	4.4	4.0	3.9	3.8
17	4.0	3.95	4.10	3.9	3.8	3.8	4.0	4.4	4.4	4.0	3.9	3.8
18	4.0	3.95	4.10	3.9	3.8	3.9	4.0	4.4	4.4	4.0	3.8	3.8
19	4.0	3.95	4.05	4.0	3.8	3.9	4.1	4.4	4.4	4.0	3.8	3.8
20	4.0	4.0	3.95	4.0	3.8	3.9	4.1	4.4	4.4	4.0	3.8	3.8
21	4.0	4.0	3.90	3.9	3.8	4.0	4.1	4.4	4.4	4.0	3.8	3.8
22	4.0	4.0	3.90	3.9	3.8	4.0	4.2	4.4	4.4	4.0	3.8	3.8
23	3.95	4.1	3.95	3.5	3.8	4.0	......	4.3	4.3	3.9	3.8	3.8
24	3.95	4.2	4.00	3.8	3.8	4.1	4.2	4.3	4.3	3.9	3.8	3.8
25	3.95	4.2	4.00	4.1	3.8	4.0	4.3	4.3	4.3	3.9	3.8	3.8
26	3.95	4.2	3.95	3.9	3.8	4.0	4.3	4.2	4.3	3.9	3.8	3.9
27	3.95	4.1	3.95	3.8	3.7	4.0	4.3	4.2	4.3	3.9	3.8	4.0
28	3.9	4.05	3.93	3.8	3.6	4.0	4.3	4.2	4.3	3.9	3.8	3.9
29	3.9	4.1	3.92	3.8	......	4.0	4.3	4.2	4.3	3.9	3.8	3.9
30	3.9	4.2	3.93	3.8	......	4.0	4.3	4.2	4.3	3.9	3.8	3.9
31	3.9	......	3.94	3.8	......	4.0	......	4.2	......	3.9	3.8	......

Daily discharge, in second-feet, of Deschutes River at Benham Falls, near Bend, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1,480	1,420	1,570	1,420	1,420	1,240	1,540	1,670	1,600	1,600	1,420	1,360
2	1,480	1,420	1,670	1,480	1,420	1,300	1,540	1,670	1,600	1,600	1,420	1,360
3	1,480	1,420	1,780	1,480	1,360	1,300	1,600	1,670	1,670	1,600	1,420	1,360
4	1,510	1,420	1,780	1,420	1,360	1,300	1,600	1,670	1,740	1,600	1,420	1,360
5	1,510	1,420	1,740	1,420	1,360	1,300	1,600	1,670	1,740	1,600	1,420	1,420
6	1,540	1,420	1,700	1,420	1,360	1,360	1,540	1,670	1,740	1,600	1,420	1,420
7	1,510	1,450	1,670	1,420	1,360	1,360	1,540	1,670	1,740	1,540	1,420	1,420
8	1,510	1,480	1,640	1,420	1,360	1,360	1,540	1,670	1,740	1,540	1,360	1,420
9	1,480	1,480	1,640	1,480	1,360	1,360	1,540	1,740	1,740	1,540	1,360	1,420
10	1,480	1,510	1,640	1,480	1,360	1,360	1,600	1,670	1,740	1,540	1,360	1,420
11	1,480	1,540	1,600	1,420	1,360	1,360	1,600	1,670	1,740	1,540	1,360	1,420
12	1,480	1,540	1,600	1,420	1,360	1,360	1,540	1,740	1,740	1,480	1,360	1,420
13	1,480	1,510	1,600	1,420	1,360	1,360	1,480	1,670	1,740	1,480	1,360	1,420
14	1,480	1,480	1,600	1,420	1,360	1,360	1,480	1,670	1,740	1,480	1,360	1,360
15	1,480	1,480	1,570	1,420	1,360	1,360	1,480	1,670	1,740	1,480	1,420	1,360
16	1,480	1,450	1,540	1,420	1,360	1,360	1,480	1,670	1,740	1,480	1,420	1,360
17	1,480	1,450	1,540	1,420	1,360	1,360	1,480	1,740	1,740	1,480	1,420	1,360
18	1,480	1,450	1,540	1,420	1,360	1,420	1,480	1,740	1,740	1,480	1,360	1,360
19	1,480	1,450	1,510	1,480	1,360	1,420	1,540	1,740	1,740	1,480	1,360	1,360
20	1,480	1,480	1,450	1,480	1,360	1,420	1,540	1,740	1,740	1,480	1,360	1,360
21	1,480	1,480	1,420	1,420	1,360	1,480	1,540	1,740	1,740	1,480	1,360	1,360
22	1,480	1,480	1,420	1,420	1,360	1,480	1,600	1,740	1,740	1,480	1,360	1,360
23	1,450	1,540	1,450	1,180	1,360	1,480	1,600	1,670	1,670	1,420	1,360	1,360
24	1,450	1,600	1,480	1,360	1,360	1,540	1,600	1,670	1,670	1,420	1,360	1,360
25	1,450	1,600	1,480	1,540	1,360	1,480	1,670	1,670	1,670	1,420	1,360	1,360
26	1,450	1,600	1,450	1,420	1,360	1,480	1,670	1,600	1,670	1,420	1,360	1,420
27	1,450	1,540	1,450	1,360	1,300	1,480	1,670	1,600	1,670	1,420	1,360	1,480
28	1,420	1,510	1,450	1,360	1,240	1,480	1,670	1,600	1,670	1,420	1,360	1,420
29	1,420	1,540	1,420	1,360	......	1,480	1,670	1,600	1,670	1,420	1,360	1,420
30	1,420	1,600	1,450	1,360	......	1,480	1,670	1,600	1,670	1,420	1,360	1,420
31	1,420	......	1,450	1,360	......	1,480	......	1,600	......	1,420	1,360	......

NOTE.—Discharge determined from a rating curve well defined between 1,200 and 1,600 second-feet.

Monthly discharge of Deschutes River at Benham Falls, near Bend, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	1,540	1,420	1,470	90,400	A.
November	1,600	1,420	1,490	88,700	A.
December	1,780	1,420	1,560	95,900	A.
January	1,540	1,180	1,420	87,300	A.
February	1,420	1,240	1,360	75,500	B.
March	1,540	1,240	1,400	86,100	A.
April	1,670	1,480	1,570	93,400	A.
May	1,740	1,600	1,670	103,000	A.
June	1,740	1,600	1,710	102,000	A.
July	1,600	1,420	1,500	92,200	A.
August	1,420	1,360	1,380	84,800	B.
September	1,480	1,360	1,390	82,700	B.
The year	1,780	1,180	1,490	1,080,000	

DESCHUTES RIVER AT BEND, OREG.

Location.—In the NE. ¼ sec. 32, T. 17 S., R. 12 E., just below the power house of the Bend Electric Light & Power Co., at city pumping plant at Bend, Oreg., 1 mile above the diversion dam of the North canal of the Central Oregon Irrigation Co.

Records available.—December 22, 1904, to March 30, 1907, at Sizemore's bridge; April 23, 1907, to October 8, 1910, at gage below power house; October 1, 1910, to September 30, 1911, at gage above dam.

Drainage area.—Indeterminate.

Gage.—Vertical staff nailed to pier of bridge over pond, near right bank, above dam; zero level with crest; at pumping plant, vertical staff bolted to a bowlder; at Sizemore's bridge (prior to 1907), vertical staff spiked to bent.

Channel.—Broad-crested weir; actual length, 224.6 feet; broken by 19 piers; at pumping plant and cable, very rough and rocky, but permanent; at Sizemore's bridge, wide and shallow, broken by pile bents.

Discharge measurements.—April, 1907, to September 30, 1911, from Staat's bridge, three-fourths of a mile above pumping station and Bend Dam; conditions unfavorable; prior to 1907, from Sizemore's bridge.

Winter flow.—Unaffected by ice.

Diversions.—The Pilot Butte and Central Oregon canals of the Central Oregon Irrigation Co. divert water 5 miles by river above the present gage and measuring section, and have been operated since 1905. No other important diversions. No storage yet developed.

Accuracy.—Records covering period January 1, 1905, to June 30, 1906, and January 1, 1909, to September 30, 1911, good and, for certain part of the period, excellent.

Cooperation.—Gage heights since 1907 furnished by C. A. Stanburrough, engineer of the pumping plant.

Discharge measurements of Deschutes River at Bend, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Nov. 14	R. W. Davenport......	1.56	1,560	Jan. 5	R. W. Davenport......	1.46	1,390
Dec. 28	.....do..................	1.41	1,360	23	.....do..................	1.38	1,250
				May 18	.....do..................	1.43	1,330

Daily gage height, in feet, of Deschutes River at Bend, Oreg., for the year ending Sept. 30, 1911.

[C. A. Stanburrough, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.29	1.30	1.51	1.40	1.45	1.40	1.50	1.40	1.30	1.30	1.10	1.10
2	1.30	1.30	1.55	1.45	1.45	1.40	1.50	1.40	1.30	1.30	1.10	1.10
3	1.30	1.30	1.60	1.45	1.50	1.40	1.45	1.40	1.30	1.30	1.10	1.10
4	1.34	....	1.65	....	1.45	....	1.45	1.40	1.35	1.30	1.10	1.10
5	1.35	....	1.62	1.45	1.45	1.35	1.45	1.40	1.70	1.30	1.10	1.15
6	1.35	1.40	1.60	1.45	1.45	1.30	1.45	1.40	1.70	1.30	1.10	1.15
7	1.35	1.45	1.55	....	1.45	1.35	1.45	1.40	1.40	1.25	1.10	1.15
8	1.35	1.58	1.55	1.35	....	1.40	1.45	1.40	1.40	1.25	1.10	1.20
9	1.35	....	1.60	1.40	1.40	1.40	1.45	1.40	1.40	1.20	1.10	1.20
10	1.33	....	1.59	1.40	1.40	1.35	1.45	1.40	1.40	1.25	1.10	1.25
11	1.33	....	1.60	1.45	1.35	1.40	1.50	1.40	1.40	1.25	1.10	1.35
12	1.35	1.60	1.55	1.45	1.40	1.40	1.50	1.40	1.40	1.25	1.10	1.25
13	1.35	1.52	1.55	1.45	1.45	1.35	1.40	1.40	1.40	1.30	1.10	1.25
14	1.33	1.55	1.55	1.45	1.45	1.35	1.40	1.45	1.40	1.20	1.10	1.20
15	1.33	1.50	1.50	1.45	1.45	1.40	1.40	1.45	1.40	1.20	1.10	1.20
16	1.33	1.50	1.50	1.45	1.45	1.40	1.35	1.45	1.40	1.20	1.10	1.25
17	1.33	1.45	1.50	1.45	1.40	1.35	1.35	1.45	1.40	1.20	1.10	1.20
18	1.33	1.50	1.50	1.40	1.40	1.35	1.35	1.45	1.35	1.15	1.10	1.20
19	1.33	1.50	1.50	1.45	1.40	1.45	1.35	1.45	1.35	1.15	1.05	1.20
20	1.33	1.42	1.45	1.50	1.40	1.45	1.40	1.45	1.35	1.15	1.45	1.25
21	1.33	1.48	1.45	1.45	....	1.45	1.40	1.45	1.35	1.15	1.40	1.20
22	1.34	....	1.45	1.35	1.35	1.45	1.40	1.45	1.35	1.15	1.05	1.20
23	1.32	1.55	1.45	1.30	1.45	1.50	1.45	1.40	1.30	1.15	1.05	1.20
24	1.30	1.60	1.45	1.35	1.40	1.55	1.45	1.40	1.30	1.15	1.05	1.25
25	1.30	1.60	1.44	1.50	1.40	1.55	1.45	1.40	1.30	1.15	1.05	1.25
26	1.30	1.55	1.50	1.40	1.40	....	....	1.35	1.30	1.15	1.05	1.25
27	1.30	....	1.50	1.40	1.40	1.50	1.55	1.35	1.30	1.20	1.05	1.30
28	1.30	1.50	1.45	1.40	1.35	1.50	1.45	1.35	1.30	1.15	1.05	1.30
29	1.30	1.50	1.45	1.40	....	1.50	1.45	1.35	1.30	1.10	1.05	1.25
30	1.30	1.50	1.45	1.40	....	1.50	1.45	....	1.30	1.10	1.10	1.30
31	1.30	....	1.45	1.45	....	1.50	....	1.30	....	1.10	1.05	....

Daily discharge, in second-feet, of Deschutes River at Bend, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1,160	1,170	1,450	1,300	1,370	1,300	1,440	1,300	1,170	1,170	910	910
2	1,170	1,170	1,510	1,370	1,370	1,300	1,440	1,300	1,170	1,170	910	910
3	1,170	1,170	1,580	1,370	1,440	1,300	1,370	1,300	1,170	1,170	910	910
4	1,220	1,200	1,660	1,370	1,370	1,270	1,370	1,300	1,240	1,170	910	910
5	1,240	1,250	1,610	1,370	1,370	1,240	1,370	1,300	1,730	1,170	910	980
6	1,240	1,300	1,580	1,370	1.370	1,170	1,370	1,300	1,730	1,170	910	980
7	1,240	1,370	1,510	1,300	1,370	1,240	1,370	1,300	1,300	1,100	910	980
8	1,240	1,550	1,510	1,240	1,340	1,300	1,370	1,300	1,300	1.100	910	1,040
9	1,240	1.550	1,580	1,300	1,300	1,300	1,370	1,300	1,300	1,040	910	1,040
10	1,210	1,580	1,570	1,300	1,300	1,240	1,370	1,300	1,300	1,100	910	1,100
11	1.210	1,580	1,580	1,370	1,240	1,300	1,440	1,300	1,300	1,100	910	1,240
12	1,240	1,580	1,510	1.370	1,300	1,300	1,440	1,300	1,300	1.100	910	1,100
13	1,240	1,470	1.510	1,370	1,370	1,240	1,300	1,300	1.300	1,170	910	1,100
14	1,210	1,510	1,510	1,370	1,370	1.240	1,300	1,370	1,300	1,040	910	1,040
15	1,210	1,440	1,440	1,370	1,370	1,300	1,300	1,370	1,300	1,040	910	1.040
16	1,210	1,440	1,440	1,370	1,370	1,300	1,240	1,370	1,300	1,040	910	1,100
17	1,210	1,370	1,440	1,370	1,300	1,240	1,240	1,370	1,300	1,040	910	1,040
18	1,210	1,440	1,440	1,300	1,300	1,240	1,240	1,370	1,240	980	910	1,040
19	1,210	1,440	1,440	1,370	1,300	1,370	1,240	1,370	1,240	980	850	1,040
20	1,210	1,330	1,370	1,440	1,300	1,370	1,300	1,370	1,240	980	1,370	1,100
21	1,210	1,410	1,370	1,370	1,270	1,370	1,300	1,370	1,240	980	1,300	1,040
22	1,220	1,450	1,370	1,240	1,240	1,370	1,300	1,370	1,240	980	850	1.040
23	1,200	1,510	1,370	1,170	1,370	1,440	1,370	1,300	1,170	980	850	1,040
24	1,170	1,580	1,370	1,240	1,300	1,510	1,370	1,300	1,170	980	850	1,100
25	1,170	1,580	1,360	1,440	1,300	1,510	1,370	1,300	1,170	980	850	1,100
26	1,170	1,510	1,440	1,300	1,300	1,480	1,440	1,240	1,170	980	850	1,100
27	1,170	1,470	1,440	1,300	1,300	1,440	1,510	1,240	1,170	1,040	850	1,170
28	1,170	1,440	1,370	1,300	1,240	1,440	1,370	1,240	1.170	980	850	1,170
29	1,170	1,440	1,370	1.300	....	1,440	1,370	1,240	1,170	910	850	1,100
30	1,170	1,440	1,370	1,300	....	1,440	1,370	1,200	1,170	910	910	1,170
31	1,170	....	1,370	1,370	....	1,440	....	1,170	....	910	850	....

NOTE.—Discharge determined from a well-defined rating curve.

Monthly discharge of Deschutes River at Bend, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	1,240	1,160	1,200	73,800	A.
November	1,580	1,170	1,420	84,500	A.
December	1,660	1,360	1,470	90,400	A.
January	1,440	1,170	1,330	81.800	B.
February	1,440	1,240	1,330	73,900	A.
March	1,510	1,170	1,340	82,400	A.
April	1,510	1,240	1,360	80,900	A.
May	1,370	1,170	1,310	80,600	A.
June	1,730	1,170	1,270	75,600	A.
July	1,170	910	1,050	64,600	A.
August	1,370	850	918	56,400	A.
September	1,240	910	1,050	62,500	A.
The year	1,730	850	1,250	907,000	

CENTRAL OREGON CANAL NEAR BEND, OREG.

Location.—In sec. 7, T. 18 S., R. 12 E. at a flume section 1 mile below the point where the waters in the main diversion canal are divided between this canal and the Pilot Butte canal; about 2 miles south from Bend, Oreg.

Records available.—May 11, 1905, to September 30, 1911.

Gage.—Vertical staff, consisting of a painted strip of galvanized iron nailed to the inside of flume on right side.

Channel.—A plank flume of rectangular cross section provided with battened seams. Flume rather unstable, but the rating appears not to change.

Discharge measurements.—Made from yoke of flume at gage section.

Winter flow.—Canal operated almost continuously. The flow in winter is small in volume. The fall through the section at the gage is sufficient to maintain open channel at all times.

Accuracy.—Records accurate. Earlier records of discharge of over 100 second-feet subject to revision on account of inaccurate method of measurement.

Cooperation.—Station maintained in cooperation with the Central Oregon Irrigation Co.

The following discharge measurement was made by R. W. Davenport:

May 17, 1911: Gage height, 2.40 feet; discharge, 200 second-feet.

Daily gage height, in feet, of Central Oregon canal near Bend, Oreg., for the year ending Sept. 30, 1911.

[N. P. Vinyard, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.2	2.1	0.9	0.85	0.3	0.0	1.8	2.4	2.6	2.8	2.9	2.7
2	2.25	2.1	1.15	.0	.3	.0	1.8	2.5	2.6	2.7	3.0	2.7
3	2.2	2.1	1.65	.2	.3	.4	1.8	2.5	2.7	2.7	3.0	2.7
4	2.3	2.05	1.65	.4	.3	1.25	1.8	2.45	2.8	2.7	3.0	2.7
5	2.3	......	1.8	.4	.3	1.5	1.7	2.45	1.4	2.7	3.0	2.7
6	2.3	.15	1.8	.4	.3	1.5	1.55	2.45	.32	2.7	3.0	2.7
7	2.3	.3	1.5	.4	.3	1.4	1.55	2.45	2.4	2.7	3.0	2.6
8	2.3	.35	1.5	1.2	.3	1.35	1.55	2.5	2.6	2.8	3.0	2.5
9	2.3	.35	1.5	1.5	.3	1.35	1.55	2.45	2.6	2.8	3.0	2.5
10	2.3	.35	1.5	.95	1.3	1.35	1.55	2.4	2.6	2.8	2.9	2.5
11	2.3	.2	1.5	.4	1.5	.9	1.6	2.4	2.6	2.8	3.0	2.35
12	2.3	.2	1.5	.4	.6	.4	1.6	2.4	2.7	2.9	3.0	2.4
13	2.3	.2	.75	.4	.4	.35	1.6	2.4	2.7	3.0	2.9	2.3
14	2.3	......	.75	.4	.4	.65	1.6	2.4	2.7	2.9	2.9	2.2
15	2.3	......	1.5	.4	.4	.7	1.9	2.4	2.7	3.0	2.9	2.2
16	2.2	.35	1.5	.4	.4	.75	1.9	2.4	2.7	3.0	2.9	2.15
17	2.2	1.1	1.5	.4	.4	.8	1.9	2.4	2.7	3.0	2.9	2.1
18	2.2	1.1	1.5	.4	.4	.95	1.9	2.4	2.8	3.0	2.9	2.1
19	2.2	1.1	1.5	.35	.4	.9	1.9	2.4	2.8	3.0	2.9	2.1
20	2.1	1.1	1.5	.3	.85	1.0	1.9	2.4	2.8	3.0	.6	2.1
21	2.1	1.1	1.0	.4	1.8	1.0	2.05	2.4	2.8	3.0	1.6	2.05
22	2.1	1.1	1.0	.2	1.8	1.0	2.2	2.4	2.9	3.0	3.0	2.05
23	2.1	1.1	.8	.0	.4	.7	2.2	2.4	3.0	3.0	3.0	2.1
24	2.1	1.1	.8	1.55	.4	.2	1.3	2.4	3.0	3.0	2.9	2.15
25	2.1	1.1	.6	2.0	.4	.0	1.9	2.4	2.9	3.0	2.9	2.15
26	2.1	1.1	.4	1.55	.4	.0	2.2	2.35	3.0	3.0	2.9	2.1
27	2.1	1.0	.4	1.1	.4	.0	2.2	2.35	2.8	2.2	2.9	2.1
28	2.1	.9	.9	.3	.4	.35	2.3	2.3	2.8	2.2	2.9	2.1
29	2.1	.9	.9	.15	......	1.45	2.3	2.35	2.8	2.5	2.9	2.1
30	2.1	.9	1.1	.15	......	1.6	2.3	2.35	2.8	2.9	2.8	2.1
31	2.1	......	1.3	.3	......	1.65	......	2.5	......	3.0	2.8	......

Daily discharge, in second-feet, of Central Oregon canal near Bend, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	170	158	42	38	8	0	123	194	220	246	259	233
2	176	158	61	0	8	0	123	207	220	233	272	233
3	170	158	107	4	8	12	123	207	233	233	272	233
4	182	152	107	12	8	70	123	200	246	233	272	233
5	182	0	123	12	8	92	112	200	83	233	272	233
6	182	2	123	12	8	92	97	200	9	233	272	233
7	182	8	92	12	8	83	97	200	194	233	272	220
8	182	10	92	65	8	78	97	207	220	246	272	207
9	182	10	92	92	8	78	97	200	220	246	272	207
10	182	10	92	46	74	78	97	194	220	246	259	207
11	182	4	92	12	92	42	102	194	220	246	272	188
12	182	4	92	12	22	12	102	194	233	259	272	194
13	182	4	32	12	12	10	102	194	233	272	259	182
14	182	0	32	12	12	25	102	194	233	259	259	170
15	182	0	92	12	12	28	134	194	233	272	259	170
16	170	10	92	12	12	32	134	194	233	272	259	164
17	170	57	92	12	12	35	134	194	233	272	259	158
18	170	57	92	12	12	46	134	194	246	272	259	158
19	170	57	92	10	12	42	134	194	246	272	259	158
20	158	57	92	8	38	49	134	194	246	272	22	158
21	158	57	49	12	123	49	152	194	246	272	102	152
22	158	57	49	4	123	49	170	194	259	272	272	152
23	158	57	35	0	12	28	170	194	272	272	272	158
24	158	57	35	97	12	4	74	194	272	272	259	164
25	158	57	22	146	12	0	134	194	259	272	259	164
26	158	57	12	97	12	0	170	188	272	272	259	158
27	158	49	12	57	12	0	170	188	246	170	259	158
28	158	42	42	8	12	10	182	182	246	170	259	158
29	158	42	42	2	....	88	182	188	246	207	259	158
30	158	42	57	2	....	102	182	188	246	259	246	158
31	158	....	74	8	....	107	....	207	....	272	246	....

NOTE.—Discharge determined from a rating curve well defined between 30 and 300 second-feet.

Monthly discharge of Central Oregon canal near Bend, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	182	158	170	10,500	A.
November	158	0	47.8	2,840	A.
December	123	12	69.7	4,290	A.
January	146	0	27.1	1,670	B.
February	123	8	25.0	1,390	B.
March	107	0	43.3	2,660	B.
April	182	74	130	7,740	A.
May	207	182	195	12,000	A.
June	272	9	226	13,400	A.
July	272	170	250	15,400	A.
August	272	22	250	15,400	A.
September	233	152	184	10,900	A.
The year	272	0	136	98,200	

PILOT BUTTE CANAL NEAR BEND, OREG.

Location.—In sec. 7, T. 18 S., R. 12 E., at a point in the canal directly opposite the gaging station on Central Oregon canal, about 2 miles south of Bend and 1 mile below the point where the waters are divided between this canal and the Central Oregon canal.

Records available.—March 6, 1905, to September 30, 1911.

Gage.—Vertical staff on right bank directly opposite the gage in flume of Central Oregon canal.

Channel.—Gage section is in rock and is permanent.

Discharge measurements.—Made by wading at the gage or from a highway bridge half a mile below the gage.

Winter flow.—Operated intermittently during the frozen season to provide water for stock and domestic purposes. No ice effect.

Accuracy.—Conditions favorable; results excellent.

Cooperation.—Station maintained in cooperation with the Central Oregon Irrigation Co.

The following discharge measurement was made by R. W. Davenport:

May 17, 1911: Gage height, 2.56 feet; discharge, 136 second-feet.

Daily gage height, in feet, of Pilot Butte canal near Bend, Oreg., for the year ending Sept. 30, 1911.

[N. P. Vinyard, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.50	2.40	2.25	......	......	......	......	2.60	2.75	2.80	2.85	2.85
2	2.52	2.40	2.10	......	......	......	1.00	2.60	2.80	2.80	2.85	2.85
3	2.52	2.40	1.90	......	......	......	2.15	2.60	2.80	2.85	2.85	2.85
4	2.52	2.40	1.85	......	......	1.70	2.15	2.60	2.80	2.85	2.85	2.85
5	2.50	2.40	1.75	......	......	1.80	2.15	2.65	1.42	2.85	2.85	2.80
6	2.45	2.40	1.70	0.78	......	1.95	2.02	2.65	.75	2.85	2.85	2.75
7	2.45	1.20	1.70	1.85	......	2.00	1.90	2.65	2.70	2.85	2.85	2.70
8	2.45	......	1.70	2.18	......	1.02	2.00	2.70	2.80	2.85	2.90	2.65
9	2.45	......	1.62	1.10	......	......	2.12	2.65	2.80	2.85	2.90	2.60
10	2.45	......	1.55	......	......	......	2.15	2.65	2.80	2.85	2.90	2.55
11	2.45	......	1.55	......	......	.70	2.15	2.65	2.80	2.90	2.90	2.55
12	2.45	1.18	1.55	......	......	1.40	2.15	2.60	2.80	2.90	2.90	2.55
13	2.45	1.18	1.72	......	......	2.05	2.20	2.60	2.85	2.90	2.90	2.50
14	2.45	......	2.10	......	......	2.05	2.25	2.60	2.85	2.90	2.90	2.50
15	2.45	......	2.10	......	......	1.95	2.25	2.60	2.85	2.90	2.90	2.50
16	2.45	.75	2.10	.78	......	.96	2.28	2.55	2.85	2.90	2.90	2.50
17	2.45	1.35	......	1.55	......	......	2.30	2.55	2.85	2.90	2.90	2.50
18	2.45	1.20	......	1.55	1.90	.75	2.35	2.55	2.85	2.90	2.90	2.50
19	2.45	1.65	......	1.72	2.00	......	2.40	2.55	2.85	2.85	2.90	2.50
20	2.40	2.10	......	.95	......	.80	2.40	2.60	2.85	2.85	1.30	2.50
21	2.40	1.05	......	......	......	2.05	2.40	2.60	2.85	2.85	1.90	2.45
22	2.40	......	......	......	......	2.10	2.42	2.60	2.85	2.85	1.68	2.42
23	2.40	......	1.80	......	......	2.15	2.48	2.65	2.85	2.85	2.85	2.40
24	2.40	......	2.05	......	......	1.08	2.20	2.65	2.85	2.85	2.90	2.40
25	2.40	......	1.05	......	......	......	2.55	2.65	2.85	2.85	2.90	2.40
26	2.40	......	......	......	......	......	2.55	2.65	2.85	2.85	2.90	2.40
27	2.40	1.10	......	......	......	......	......	2.05	2.85	2.90	2.90	2.40
28	2.40	2.20	......	2.00	......	......	1.28	2.05	2.85	2.90	2.90	2.40
29	2.40	2.20	......	2.00	......	......	2.55	2.70	2.80	2.95	2.90	2.40
30	2.40	2.22	......	2.00	......	......	2.60	2.70	2.85	2.90	2.90	2.40
31	2.40	......	......	1.05	......	......	......	2.70	......	2.85	2.85	......

NOTE.—Canal dry on days for which no gage height is given.

Daily discharge, in second-feet, of Pilot Butte canal near Bend, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	127	111	88	0	0	0	0	144	172	182	192	192
2	130	111	66	0	0	0	4	144	182	182	192	192
3	130	111	42	0	0	0	73	144	182	192	192	192
4	130	111	38	0	0	27	73	144	182	192	192	192
5	130	111	30	0	0	34	73	153	13	192	192	182
6	119	111	27	2	0	48	56	153	2	192	192	172
7	119	7	27	38	0	53	42	153	162	192	192	162
8	119	0	27	77	0	4	53	162	182	192	202	153
9	119	0	22	5	0	0	69	153	182	192	202	144
10	119	0	18	0	0	0	73	153	182	192	202	136
11	119	0	18	0	0	2	73	153	182	202	202	136
12	119	7	18	0	0	12	73	144	182	202	202	136
13	119	7	28	0	0	60	80	144	192	202	202	127
14	119	0	66	0	0	60	88	144	192	202	202	127
15	119	0	66	0	0	48	88	144	192	202	202	127
16	119	2	66	2	0	4	92	136	192	202	202	127
17	119	10	0	18	0	0	95	136	192	202	202	127
18	119	7	0	18	42	2	103	136	192	202	202	127
19	119	24	0	28	53	0	111	136	192	192	202	127
20	111	66	0	4	0	2	111	144	192	192	9	127
21	111	4	0	0	0	60	111	144	192	192	42	119
22	111	0	0	0	0	66	114	144	192	192	26	114
23	111	0	34	0	0	73	124	153	192	192	192	111
24	111	0	60	0	0	5	80	153	192	192	202	111
25	111	0	4	0	0	0	136	153	192	192	202	111
26	111	0	0	0	0	0	136	153	192	192	202	111
27	111	5	0	0	0	0	0	60	192	202	202	111
28	111	80	0	53	0	0	9	60	192	202	202	111
29	111	80	0	53	....	0	136	162	182	212	202	111
30	111	83	0	53	....	0	144	162	192	202	202	111
31	111	....	0	4	....	0	....	162	....	192	192	....

NOTE.—Discharge determined from a rating curve well defined between 25 and 250 second-feet.

Monthly discharge of Pilot Butte canal near Bend, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	130	111	118	7,260	A.
November	111	0	34.9	2,080	B.
December	88	0	24.0	1,480	B.
January	77	0	11.5	707	C.
February	53	0	3.4	189	B.
March	73	0	18.1	1,110	A.
April	144	0	80.7	4,800	A.
May	162	60	143	8,790	A.
June	192	2	175	10,400	A.
July	202	182	196	12,100	A.
August	202	9	182	11,200	A.
September	192	111	138	8,210	A.
The year	202	0	94.2	68,300	

DESCHUTES RIVER AT LAIDLAW, OREG.

Location.—In the NE. ¼ sec. 31, T. 16 S., R. 12 E., at the highway bridge in Laidlaw, 9 miles by river below Bend, 3 miles below Tumalo Creek, and below all important diversions.

Records available.—January 1, 1909, to September 30, 1911. Records prior to July, 1910, questionable.

Drainage area.—Not measured.

Gage.—Vertical staff at old highway bridge at Laidlaw.

Channel.—Gravel. Control permanent. Two channels at the gage, about two-thirds of the flow passing in the right channel in which the gage is placed. The channel divides about 200 feet above the bridge.

Discharge measurements.—From wagon bridge 1½ miles above gage, in the SE. ¼ sec. 6, T. 17 S., R. 12 E.

Winter flow.—Probably somewhat affected by ice in extremely cold weather.

Diversions.—Two small canals divert between this station and that at Bend.

Accuracy.—Fair; measuring conditions unsatisfactory.

Discharge measurements of Deschutes River at Laidlaw, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Nov. 14	R. W. Davenport	1.65	1,770	Jan. 28	R. W. Davenport	1.51	1,480
Dec. 21	.....do	1.56	1,560	May 19	.....do	1.52	1,400
22	.....do	1.57	1,560				
22	.....do	1.57	1,650				
29	.....do	1.57	1,620				

Daily gage height, in feet, of Deschutes River at Laidlaw, Oreg., for the year ending Sept. 30, 1911.

[G. W. Horner, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.35	1.38	1.60	1.50	1.55	1.55	1.55	1.50	1.45	1.45	1.10	1.10
2	1.35	1.38	1.68	1.55	1.55	1.50	1.55	1.50	1.50	1.40	1.10	1.10
3	1.35	1.38	1.75	1.55	1.55	1.50	1.55	1.50	1.50	1.40	1.10	1.15
4	1.38	1.38	1.76	1.55	1.55	1.45	1.55	1.50	1.50	1.40	1.10	1.10
5	1.40	1.38	1.76	1.55	1.55	1.40	1.50	1.50	1.50	1.40	1.10	1.15
6	1.40	1.38	1.70	1.55	1.55	1.40	1.55	1.50	1.80	1.40	1.10	1.15
7	1.42	1.38	1.68	1.55	1.55	1.40	1.55	1.50	1.80	1.40	1.10	1.20
8	1.42	......	1.68	1.50	1.55	1.40	1.55	1.50	1.55	1.30	1.10	1.25
9	1.42	......	1.68	1.50	1.55	1.50	1.50	1.50	1.55	1.30	1.10	1.25
10	1.40	1.65	1.68	1.50	1.55	1.50	1.55	1.50	1.55	1.30	1.10	1.25
11	1.40	1.70	1.68	1.55	1.50	1.50	1.55	1.50	1.55	1.30	1.10	1.25
12	1.40	1.70	1.68	1.55	1.50	1.50	1.55	1.50	1.60	1.30	1.10	1.20
13	1.40	1.60	1.65	1.55	1.55	1.50	1.50	1.50	1.60	1.30	1.10	1.25
14	1.40	1.65	1.63	1.55	1.50	1.50	1.50	1.50	1.60	1.30	1.10	1.25
15	1.40	1.65	1.60	1.55	1.50	1.55	1.45	1.50	1.65	1.30	1.10	1.25
16	1.40	1.65	1.60	1.55	1.50	1.55	1.45	1.50	1.60	1.25	1.10	1.25
17	1.40	1.60	1.60	1.55	1.50	1.55	1.45	1.50	1.55	1.25	1.07	1.25
18	1.40	1.60	1.60	1.55	1.50	1.55	1.45	1.50	1.50	1.25	1.07	1.25
19	1.40	1.60	1.60	1.60	1.50	1.55	1.45	1.55	1.50	1.20	1.07	1.25
20	1.40	1.60	1.60	1.55	1.50	1.55	1.50	1.50	1.50	1.20	1.40	1.25
21	1.40	1.58	1.55	1.60	1.50	1.55	1.50	1.50	1.50	1.20	1.45	1.25
22	1.40	1.60	1.58	1.55	1.45	1.55	1.50	1.50	1.45	1.20	1.15	1.25
23	1.40	1.70	1.58	1.55	1.45	1.60	1.50	1.50	1.40	1.20	1.07	1.25
24	1.40	1.72	1.58	1.55	1.50	1.65	1.50	1.50	1.40	1.20	1.07	1.25
25	1.40	1.70	1.60	1.55	1.50	1.70	1.65	1.45	1.40	1.20	1.07	1.25
26	1.40	1.70	1.60	1.55	1.50	1.65	1.55	1.45	1.38	1.20	1.07	1.30
27	1.40	1.68	1.60	1.55	1.50	1.65	1.60	1.42	1.50	1.20	1.07	1.30
28	1.38	1.70	1.60	1.55	1.60	1.60	1.50	1.42	1.50	1.20	1.07	1.30
29	1.38	1.60	1.60	1.55	......	1.60	1.50	1.45	1.45	1.20	1.07	1.30
30	1.35	1.60	1.58	1.50	......	1.55	1.50	1.45	1.38	1.15	1.15	1.30
31	1.38	......	1.58	1.55	......	1.55	......	1.45	......	1.10	1.10	......

NOTE.—No ice reported by observer, but gage heights may have been slightly affected by ice during January, 1911.

Daily discharge, in second-feet, of Deschutes River at Laidlaw, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1,240	1,270	1,580	1,440	1,510	1,510	1,510	1,440	1,370	1,370	930	960
2	1,240	1,270	1,700	1,510	1,510	1,440	1,510	1,440	1,440	1,300	930	960
3	1,240	1,270	1,810	1,510	1,510	1,440	1,510	1,440	1,440	1,300	930	985
4	1,270	1,270	1,830	1,510	1,510	1,370	1,510	1,440	1,440	1,300	930	930
5	1,300	1,270	1,830	1,510	1,510	1,300	1,440	1,440	1,440	1,300	930	985
6	1,300	1,270	1,730	1,510	1,510	1,300	1,510	1,440	1,890	1,300	930	985
7	1,330	1,270	1,700	1,510	1,510	1,300	1,510	1,440	1,890	1,300	930	1,040
8	1,330	1,400	1,700	1,440	1,510	1,300	1,510	1,440	1,510	1,170	930	1,100
9	1,330	1,530	1,700	1,440	1,510	1,440	1,440	1,440	1,510	1,170	930	1,100
10	1,300	1,660	1,700	1,440	1,510	1,440	1,510	1,440	1,510	1,170	930	1,100
11	1,300	1,730	1,700	1,510	1,440	1,440	1,510	1,440	1,510	1,170	930	1,100
12	1,300	1,730	1,700	1,510	1,440	1,440	1,510	1,440	1,580	1,170	930	1,040
13	1,300	1,580	1,660	1,510	1,510	1,440	1,440	1,440	1,580	1,170	930	1,100
14	1,300	1,660	1,620	1,510	1,440	1,440	1,440	1,440	1,580	1,170	930	1,100
15	1,300	1,660	1,580	1,510	1,440	1,510	1,370	1,440	1,660	1,170	930	1,100
16	1,300	1,660	1,580	1,510	1,440	1,510	1,370	1,440	1,580	1,100	930	1,100
17	1,300	1,580	1,580	1,510	1,440	1,510	1,370	1,440	1,510	1,100	897	1,100
18	1,300	1,580	1,580	1,510	1,440	1,510	1,370	1,440	1,440	1,100	897	1,100
19	1,300	1,580	1,580	1,580	1,440	1,510	1,370	1,510	1,440	1,040	897	1,100
20	1,300	1,580	1,580	1,510	1,440	1,510	1,440	1,440	1,440	1,040	1,300	1,100
21	1,300	1,550	1,510	1,580	1,440	1,510	1,440	1,440	1,440	1,040	1,370	1,100
22	1,300	1,580	1,550	1,510	1,370	1,510	1,440	1,440	1,370	1,040	985	1,100
23	1,300	1,730	1,550	1,510	1,370	1,580	1,440	1,440	1,300	1,040	897	1,100
24	1,300	1,760	1,550	1,510	1,440	1,660	1,440	1,440	1,300	1,040	897	1,100
25	1,300	1,730	1,580	1,510	1,440	1,730	1,660	1,370	1,300	1,040	897	1,100
26	1,300	1,730	1,580	1,510	1,440	1,660	1,510	1,370	1,270	1,040	897	1,170
27	1,300	1,700	1,580	1,510	1,440	1,660	1,580	1,330	1,440	1,040	897	1,170
28	1,270	1,730	1,580	1,510	1,580	1,580	1,440	1,330	1,440	1,040	897	1,170
29	1,270	1,580	1,580	1,510	....	1,580	1,440	1,370	1,370	1,040	897	1,170
30	1,240	1,580	1,550	1,440	....	1,510	1,440	1,370	1,270	985	985	1,170
31	1,270	....	1,550	1,510	....	1,510	....	1,370	....	930	930	....

NOTE.—Discharge determined from a rating curve well defined between 900 and 2,500 second-feet.

Monthly discharge of Deschutes River at Laidlaw, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	1,330	1,240	1,290	79,300	A.
November	1,760	1,270	1,550	92,200	A.
December	1,830	1,510	1,630	100,000	A.
January	1,580	1,440	1,500	92,200	B.
February	1,580	1,370	1,470	81,600	A.
March	1,730	1,300	1,490	91,600	A.
April	1,660	1,370	1,470	87,500	A.
May	1,510	1,330	1,420	87,300	A.
June	1,890	1,270	1,480	88,100	A.
July	1,370	930	1,140	70,100	A.
August	1,370	897	949	58,400	A.
September	1,170	930	1,080	64,300	B.
The year	1,890	897	1,370	993,000	

DESCHUTES RIVER NEAR CLINE FALLS, OREG.

Location.—In sec. 13, T. 15 S., R. 12 E., 12 miles below Laidlaw, about 4 miles west of Redmond, and 1½ miles southwest of Cline Falls.

Records available.—February 15, 1910, to March 4, 1911.

Drainage area.—Not measured.

Gage.—Verical staff on right bank.

Channel.—Sand, gravel, and bowlders; some moss grows on the bottom; practically permanent.

Winter flow.—Not materially affected by ice.

Discharge measurements.—Made from a boat which is operated on a tight wire stretched across the stream near the gage.

Diversions.—Flow affected by diversions as at Bend and Laidlaw stations.

Accuracy.—Curve well developed; results very reliable.

Cooperation.—Gage readings furnished by I. L. Harader.

Discharge measurements of Deschutes River near Cline Falls, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Nov. 9	R. W. Davenport......	1.11	1,390	June 3	R. W. Davenport......	0.92	1,190
Dec. 21	.....do..................	.97	1,250				

Daily gage height, in feet, and discharge, in second-feet, of Deschutes River near Cline Falls, Oreg., for the year ending Sept. 30, 1911.

[I. L. Harader, observer.]

Day.	October.		November.		December.		January.		February.		March.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1........	0.8	1,060	0.8	1,060	1.1	1,390	0.97	1,240	1.00	1,270	0.95	1,220
2........	.75	1,020	.8	1,060	1.1	1,390	.97	1,240	1.00	1,270	.90	1,160
3........	.8	1,060	.8	1,060	1.15	1,460	.97	1,240	1.00	1,270	.93	1,190
4........	.85	1,110	.8	1,060	1.25	1,600	.97	1,240	.97	1,240	.93	1,190
5........	.85	1,110	.85	1,110	1.25	1,600	.97	1,240	.97	1,240	......	....
6........	.85	1,110	.95	1,220	1.2	1,530	.97	1,240	.98	1,250	......	....
7........	.85	1,110	1.0	1,270	1.2	1,530	.97	1,240	.98	1,250	......	....
8........	.85	1,110	1.1	1,390	1.15	1,460	1.05	1,330	.97	1,240	......	....
9........	.8	1,060	1.1	1,390	1.15	1,460	1.05	1,330	.97	1,240	......	....
10........	.8	1,060	1.1	1,390	1.1	1,390	1.00	1,270	.95	1,220	......	....
11........	.8	1,060	1.1	1,390	1.1	1,390	1.00	1,270	.90	1,160	......	....
12........	.8	1,060	1.1	1,390	1.1	1,390	1.03	1,310	.95	1,220	......	....
13........	.8	1,060	1.1	1,390	1.1	1,390	1.00	1,270	.97	1,240	......	....
14........	.8	1,060	1.15	1,460	1.1	1,390	1.00	1,270	.94	1,200	......	....
15........	.8	1,060	1.15	1,460	1.1	1,390	1.00	1,270	.95	1,220	......	....
16........	.8	1,060	1.1	1,390	1.1	1,390	1.00	1,270	.95	1,220	......	....
17........	.8	1,060	1.05	1,330	1.1	1,390	1.00	1,270	.95	1,220	......	....
18........	.8	1,060	1.05	1,330	1.1	1,390	1.00	1,270	.95	1,220	......	....
19........	.8	1,060	1.05	1,330	1.1	1,390	1.02	1,290	.95	1,220	......	....
20........	.8	1,060	1.0	1,270	1.0	1,270	1.00	1,270	.95	1,220	......	....
21........	.8	1,060	1.0	1,270	1.0	1,270	1.02	1,290	.85	1,110	......	....
22........	.8	1,060	1.1	1,390	1.0	1,270	1.00	1,270	.85	1,110	......	....
23........	.8	1,060	1.2	1,530	1.0	1,270	1.00	1,270	.94	1,200	......	....
24........	.8	1,060	1.2	1,530	1.0	1,270	.98	1,250	.95	1,220	......	....
25........	.8	1,060	1.2	1,530	1.05	1,330	.95	1,220	.95	1,220	......	....
26........	.8	1,060	1.2	1,530	1.05	1,330	.95	1,220	.93	1,190	......	....
27........	.8	1,060	1.15	1,460	1.05	1,330	.95	1,220	.95	1,220	......	....
28........	.8	1,060	1.2	1,530	1.0	1,270	.92	1,180	.95	1,220	......	....
29........	.8	1,060	1.2	1,530	1.0	1,270	.90	1,160	......	....	......	....
30........	.8	1,060	1.1	1,390	1.0	1,270	.94	1,200	......	....	......	....
31........	.8	1,060	......	....	1.05	1,330	.92	1,180	......	....	......	....

NOTE.—Discharge determined from a well-defined rating curve.

Monthly discharge of Deschutes River near Cline Falls, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	1,110	1,020	1,070	65,800	A.
November	1,530	1,060	1,350	80,300	A.
December	1,600	1,270	1,380	84,800	A.
January	1,330	1,160	1,250	76,900	A.
February	1,270	1,110	1,220	67,800	A.
The period				376,000	

DESCHUTES RIVER AT MECCA, OREG.

Location.—In the SW. ¼ sec. 20, T. 9 S., R. 13 E., at ferry at Mecca, 1½ miles below mouth of Shitike Creek, and 12 miles above mouth of Warm Spring River.

Records available.—June 7 to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to tree on right bank, 100 yards above Government ferry.

Channel.—Rock and heavy gravel; practically permanent.

Discharge measurements.—Made from car on ferry cable.

Winter flow.—Not affected by ice.

Diversions.—Flow affected by same diversions from upper Deschutes River as Bend, Laidlaw, and Cline Falls stations. Summer flow of Crooked River practically all diverted.

Cooperation.—Station maintained at expense of Office of Indian Affairs.

Estimates withheld for additional data.

The following discharge measurement was made by Charles Leidl:

July 30, 1911: Gage height, 2.52; discharge, 4,060 second-feet.

Daily gage height, in feet, of Deschutes River at Mecca, Oreg., for the year ending Sept. 30, 1911.

[E. Chaloupka, observer.]

Day.	June.	July.	Aug.	Sept.	Day.	June.	July.	Aug.	Sept.
1		2.8	2.5	2.5	16	3.1	2.8	2.4	2.6
2		2.8	2.5	2.5	17	3.2	2.8	2.4	2.6
3		2.8	2.5	2.5	18	3.1	2.8	2.4	2.6
4		2.8	2.5	2.5	19	3.0	2.8	2.4	2.6
5		2.9	2.5	2.5	20	2.9	2.7	2.4	2.6
6		2.9	2.5	2.5	21	2.9	2.6	2.6	2.6
7	3.2	2.8	2.5	2.5	22	2.9	2.5	2.6	2.6
8	3.0	2.8	2.5	2.5	23	2.8	2.5	2.6	2.6
9	3.0	2.8	2.5	2.5	24	2.8	2.5	2.6	2.6
10	2.9	2.8	2.5	2.6	25	2.8	2.5	2.6	2.6
11	3.1	2.8	2.5	2.6	26	2.8	2.5	2.6	2.6
12	3.1	2.7	2.5	2.6	27	3.0	2.5	2.6	2.6
13	3.2	2.7	2.4	2.6	28	3.0	2.5	2.6	2.6
14	3.2	2.7	2.4	2.6	29	2.8	2.5	2.6	2.6
15	3.2	2.8	2.4	2.6	30	2.8	2.5	2.6	2.6
					31		2.5	2.5	

DESCHUTES RIVER AT MOODY, NEAR BIGGS, OREG.

Location.—In the SE. ¼ sec. 26, T. 2 N., R. 15 E., 1 mile below Moody railroad station, 1½ miles above the bridge of the Oregon-Washington Railroad & Navigation Co., about 5 miles southwest of Biggs, Oreg., and 1½ miles above the mouth of the river.

Records available.—July 7, 1906, to September 30, 1911; October 19, 1897, to December 31, 1899, for a station near Moro, 10 miles above the mouth of the river, in the NE. ¼ sec. 5, T. 1 S., R. 16 E. Records for 1908 and 1910 somewhat fragmentary.

Drainage area.—About 9,180 square miles.

Gage.—Staff in two sections—the lower inclined, the upper vertical. At Moro station, gage was an inclined staff.

Discharge measurements.—Made from a cable about 450 feet above the gage. At Moro station made from the "free bridge," 3 miles below the gage.

Diversions.—Summer discharge at this station has been progressively reduced since about 1904 or 1905 by diversions from the upper river. Some of this water returns, but the net reduction during midsummer is now probably 10 or 15 per cent.

Accuracy.—Rating curve excellent. Records good except for periods during which the gage-height record is fragmentary and for which discharge has been estimated from studies of the records.

Cooperation.—Gage heights furnished by M. A. Moody, The Dalles, Oreg.

No discharge measurements made during the year.

Daily gage height, in feet, of Deschutes River at Moody, near Biggs, Oreg., for the year ending Sept. 30, 1911.

[S. N. Arnold, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	......	......	......	2.6	2.4	3.7	2.9	2.7	2.5	2.2	2.2
2	......	......	......	......	2.6	2.4	3.8	2.9	2.8	2.5	2.2	2.2
3	......	......	......	......	2.6	2.4	3.6	2.9	2.8	2.5	2.2	2.2
4	......	......	......	......	2.6	2.4	3.4	2.9	2.8	2.5	2.2	2.3
5	......	......	......	......	2.6	2.5	3.4	2.9	2.8	2.5	2.2	2.3
6	......	......	......	......	2.6	2.5	3.2	2.9	2.7	2.5	2.2	2.3
7	......	......	......	......	2.6	2.5	3.1	3.0	2.7	2.5	2.2	2.2
8	......	......	......	......	2.6	2.5	3.0	2.9	2.8	2.4	2.2	2.2
9	......	......	......	2.6	2.6	2.5	3.0	2.9	2.9	2.4	2.2	2.3
10	......	......	......	......	2.5	2.5	3.0	2.9	2.9	2.4	2.2	2.3
11	......	......	......	......	2.5	2.5	2.9	2.9	2.8	2.4	2.2	2.3
12	......	......	......	......	2.5	2.5	2.9	2.8	2.8	2.4	2.2	2.3
13	......	......	......	......	2.5	2.6	2.9	2.8	2.9	2.3	2.2	2.3
14	......	......	......	......	2.5	2.8	2.8	2.8	2.9	2.3	2.2	2.3
15	......	......	......	......	2.5	2.9	2.8	2.8	2.9	2.3	2.2	2.2
16	......	......	......	......	2.5	2.9	2.7	2.8	2.8	2.3	2.2	2.2
17	......	......	......	......	2.5	2.9	2.7	2.8	2.8	2.3	2.2	2.2
18	......	......	......	......	2.5	2.9	2.7	2.8	2.7	2.4	2.2	2.2
19	......	......	......	3.1	2.5	......	2.7	2.8	2.7	2.4	2.2	2.2
20	......	......	......	2.8	2.5	2.9	2.8	2.9	2.6	2.4	2.2	2.2
21	......	......	2.7	......	......	3.0	2.9	2.9	2.6	2.3	2.3	2.2
22	......	......	......	2.8	......	3.4	2.9	2.9	2.6	2.3	2.3	2.2
23	......	......	......	2.7	......	3.6	2.8	2.9	2.6	2.3	2.3	2.2
24	......	......	......	2.7	......	3.7	2.8	2.8	2.5	2.3	2.2	2.2
25	2.38	......	......	......	......	3.7	2.8	2.8	2.5	2.3	2.2	2.2
26	......	......	......	2.4	......	3.6	2.9	2.8	2.5	2.3	2.2	2.2
27	......	......	......	2.6	......	3.5	2.9	2.7	2.6	2.3	2.2	2.3
28	2.34	......	......	2.4	......	3.4	3.0	2.7	2.6	2.3	2.2	2.3
29	......	......	......	2.5	......	3.2	2.9	2.7	2.6	2.2	2.2	2.3
30	......	2.95	2.7	2.4	......	3.4	2.9	2.7	2.5	2.2	2.2	2.3
31	......	......	......	......	......	3.5	......	2.7	......	2.2	2.2	......

Daily discharge, in second-feet, of Deschutes River at Moody, near Biggs, Oreg., for the year ending Sept. 30, 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	6,300	5,980	5,360	10,300	7,040	6,320	5,660	4,820	4,820
2	6,260	5,980	5,360	10,800	7,040	6,680	5,660	4,820	4,820
3	6,220	5,980	5,360	9,860	7,040	6,680	5,660	4,820	4,820
4	6,180	5,980	5,360	9,000	7,040	6,680	5,660	4,820	5,080
5	6,140	5,980	5,660	9,000	7,040	6,680	5,660	4,820	5,080
6	6,100	5,980	5,660	8,200	7,040	6,320	5,660	4,820	5,080
7	6,060	5,980	5,660	7,800	7,420	6,320	5,660	4,820	4,820
8	6,020	5,980	5,660	7,420	7,040	6,680	5,360	4,820	4,820
9	5,980	5,980	5,660	7,420	7,040	7,040	5,360	4,820	5,080
10	6,160	5,660	5,660	7,420	7,040	7,040	5,360	4,820	5,080
11	6,340	5,660	5,660	7,040	7,040	6,680	5,360	4,820	5,080
12	6,520	5,660	5,660	7,040	6,680	6,680	5,360	4,820	5,080
13	6,700	5,660	5,980	7,040	6,680	7,040	5,080	4,820	5,080
14	6,880	5,660	6,680	6,680	6,680	7,040	5,080	4,820	5,080
15	7,060	5,660	7,040	6,680	6,680	7,040	5,080	4,820	4,820
16	7,240	5,660	7,040	6,320	6,680	6,680	5,080	4,820	4,820
17	7,420	5,660	7,040	6,320	6,680	6,680	5,080	4,820	4,820
18	7,610	5,660	7,040	6,320	6,680	6,320	5,360	4,820	4,820
19	7,800	5,660	7,040	6,320	6,680	6,320	5,360	4,820	4,820
20	6,680	5,660	7,040	6,680	7,040	5,980	5,360	4,820	4,820
21	6,680	5,660	7,420	7,040	7,040	5,980	5,080	5,080	4,820
22	6,680	5,660	9,000	7,040	7,040	5,980	5,080	5,080	4,820
23	6,320	5,660	9,860	6,680	7,040	5,980	5,080	5,080	4,820
24	6,320	5,360	10,300	6,680	6,680	5,660	5,080	4,820	4,820
25	5,700	5,360	10,300	6,680	6,680	5,660	5,080	4,820	4,820
26	5,360	5,360	9,860	7,040	6,680	5,660	5,080	4,820	4,820
27	5,980	5,360	9,420	7,040	6,320	5,980	5,080	4,820	5,080
28	5,360	5,360	9,000	7,420	6,320	5,980	5,080	4,820	5,080
29	5,660	....	8,200	7,040	6,320	5,980	4,820	4,820	5,080
30	5,360	....	9,000	7,040	6,320	5,660	4,820	4,820	5,080
31	5,370	....	9,420	....	6,320	....	4,820	4,820	....

NOTE.—Discharge determined from a well-defined rating curve. Discharge Jan. 1 to 8, 10 to 18, 21, 25, 1, and Feb. 21 to 28 interpolated.

Monthly discharge of Deschutes River at Moody, near Biggs, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	....	....	5,290	325,000	B.
November	....	....	6,300	375,000	B.
December	....	....	6,820	419,000	B.
January	7,800	5,360	6,350	390,000	C.
February	5,980	5,360	5,710	317,000	A.
March	10,300	5,360	7,210	443,000	A.
April	10,800	6,320	7,450	443,000	A.
May	7,420	6,320	6,810	419,000	A.
June	7,040	5,660	6,380	380,000	A.
July	5,660	4,820	5,260	323,000	A.
August	5,080	4,820	4,850	298,000	A.
September	5,080	4,820	4,930	293,000	A.
The year	....	....	6,110	4,420,000	

NOTE.—Discharge for October, November, and December, 1910, determined from comparisons with discharge of upper Deschutes River and its tributaries.

CRESCENT LAKE OUTLET NEAR CRESCENT, OREG.

Location.—At lake outlet sec. 11, T. 24 S., R. 6 E., about 15 miles west of Crescent.
Records available.—January 11 to September 6, 1911; occasional readings.
Drainage area.—55 square miles.
Gage.—Vertical staff.
Channel.—Gravel, not likely to shift; some drift logs jammed at gage section.
Discharge measurements.—Made by wading near the gage.
Winter flow.—Probably unaffected by ice.
Cooperation.—Station has been maintained in cooperation with Hunter Land Co.

Estimates withheld for additional measurements.

Discharge measurements of Crescent Lake outlet near Crescent, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 12	R. W. Davenport	10.13	49.5
Sept. 6	R. C. Wygant	9.75	36.5

Daily gage height, in feet, of Crescent Lake outlet near Crescent, Oreg., for the year ending Sept. 30, 1911.

[J. L. Ringo, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	Aug.	Sept.
1							
2						10.05	
3							9.64
4					9.95		
5							
6			9.90	9.75		10.00	9.74
7							
8		10.25					
9						9.92	
10							
11	10.10						
12					10.13		
13						9.85	
14							
15							
16						9.80	
17							
18							
19							
20						9.77	
21							
22							
23						9.75	
24							
25							
26						9.71	
27							
28							
29							
30						9.67	
31							

EAST FORK OF DESCHUTES RIVER AT CRESCENT, OREG.

Location.—In NE. ¼ SW. ¼ sec. 30, T. 24 S., R. 9 E. at the wagon bridge at Crescent, Oreg., 5 miles above mouth of East Fork.

Records available.—December 25, 1904, to March 31, 1908, and September 25, 1910, to September 30, 1911.

Drainage area.—179 square miles.

Gage.—Vertical staff spiked to a pile supporting the bridge on upstream side.

Channel.—Coarse gravel; practically permanent except at infrequent floods.

Discharge measurements.—Made by wading or from the wagon bridge to which the gage is nailed.

Winter flow.—Materially affected by ice.

Accuracy.—Results good, except during periods of ice and extreme floods.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Discharge measurements of East Fork of Deschutes River at Crescent, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Nov. 19	R. W. Davenport	2.23	38.4	May 11	R. W. Davenport	3.22	106
20	....do	2.21	32				
Dec. 24[a]	....do	2.50	41.7				

[a] River frozen. Ice 2 to 3 inches thick.

Daily gage height, in feet, of East Fork of Deschutes River at Crescent, Oreg., for the year ending Sept. 30, 1911.

[W. J. Nichols and C. W. Long, observers.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.2	2.2	2.9	2.6	2.8	2.8	2.8	3.0	3.3	2.9	2.3	2.25
2	2.2	2.2	2.7	2.6	2.7	2.8	2.9	3.0	3.5	2.8	2.3	2.25
3	2.2	2.2	2.6	2.6	2.6	2.8	2.9	2.9	3.6	2.8	2.3	2.25
4	2.6	2.2	2.7	2.6	2.5	2.8	2.9	2.9	3.7	2.7	2.3	2.3
5	2.5	2.2	2.6	2.5	2.3	2.9	2.8	3.0	3.7	2.7	2.3	2.3
6	2.5	2.2	2.9	2.5	2.3	2.9	2.7	3.0	3.6	2.7	2.3	2.3
7	2.5	3.3	2.7	2.6	2.3	2.9	2.7	3.1	3.6	2.7	2.3	2.3
8	2.3	3.3	2.4	2.6	2.6	2.9	2.7	3.2	3.5	2.7	2.3	2.25
9	2.5	3.3	3.2	2.6	2.8	2.9	2.7	3.3	3.5	2.7	2.3	2.25
10	2.2	2.55	2.8	2.7	2.9	2.9	2.7	3.2	3.5	2.7	2.3	2.25
11	2.2	2.45	2.7	2.7	2.9	2.9	2.7	3.2	3.5	2.6	2.3	2.25
12	2.2	2.4	2.6	2.8	2.8	3.0	2.6	3.2	3.5	2.6	2.3	2.2
13	2.2	2.3	2.5	2.7	2.8	3.0	2.7	3.2	3.6	2.6	2.3	2.25
14	2.2	2.3	2.5	2.6	2.8	3.1	2.7	3.2	3.7	2.6	2.3	2.25
15	2.2	2.3	2.4	2.6	2.8	3.1	2.6	3.2	3.8	2.6	2.3	2.25
16	2.2	2.2	2.7	2.5	2.9	3.1	2.7	3.2	3.8	......	2.3	2.2
17	2.5	2.2	2.8	2.6	2.9	3.1	2.7	3.3	3.7	......	2.3	2.2
18	2.2	2.3	2.7	2.8	2.9	3.1	2.8	3.3	3.7	......	2.3	2.2
19	2.2	2.4	2.6	2.8	2.9	3.1	2.8	3.4	3.5	......	2.3	2.2
20	2.2	2.6	2.5	2.7	2.9	3.1	2.8	3.2	3.4	......	2.25	2.2
21	2.2	2.5	2.5	2.6	2.9	3.1	2.9	3.2	3.3	......	2.25	2.2
22	2.2	2.6	2.6	2.6	2.9	3.2	2.9	3.2	3.3	......	2.25	2.2
23	2.2	2.5	2.6	2.5	2.9	3.3	2.9	3.2	3.3	......	2.25	2.25
24	2.2	2.5	2.6	2.5	2.9	3.3	3.0	3.2	3.3	2.4	2.25	2.2
25	2.2	2.4	2.6	2.6	2.9	3.3	3.0	3.2	3.1	2.4	2.25	2.25
26	2.2	2.4	2.6	2.6	2.9	2.9	3.0	3.1	2.9	2.4	2.25	2.3
27	2.2	2.6	2.6	2.9	2.8	2.7	3.0	3.1	3.0	2.4	2.25	2.35
28	2.2	2.4	2.6	3.0	2.8	2.8	3.0	3.1	3.0	2.4	2.25	2.3
29	2.2	2.6	2.6	2.9	......	2.6	3.0	3.1	3.0	2.4	2.25	2.3
30	2.2	2.7	2.6	3.0	......	2.6	3.0	3.1	2.9	2.3	2.25	2.3
31	2.2	......	2.6	2.8	......	2.7	......	3.1	......	2.3	2.25	......

NOTE.—River frozen over Dec. 22, 1910, to Feb. 9, 1911; gage heights affected by ice.

Daily discharge, in second-feet, of East Fork of Deschutes River at Crescent, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	32	32	81	46	60	72	72	90	121	81	37	34
2	32	32	64	46	52	72	81	90	146	72	37	34
3	32	32	56	46	46	72	81	81	160	72	37	34
4	56	32	64	46	40	72	81	81	174	64	37	37
5	49	32	56	40	30	81	72	90	174	64	37	37
6	49	32	81	40	30	81	64	90	160	64	37	37
7	49	121	64	46	30	81	64	100	160	64	37	37
8	37	121	43	46	46	81	64	110	146	64	37	34
9	49	121	110	46	60	81	64	121	146	64	37	34
10	32	52	72	52	81	81	64	110	146	64	37	34
11	32	46	64	52	81	81	64	110	146	56	37	34
12	32	43	56	60	72	90	56	110	146	56	37	32
13	32	37	49	52	72	90	64	110	160	56	37	34
14	32	37	49	46	72	100	64	110	174	56	37	34
15	32	37	43	46	72	100	56	110	188	56	37	34
16	32	32	64	40	81	100	64	110	188	54	37	32
17	49	32	72	46	81	100	64	121	174	53	37	32
18	32	37	64	60	81	100	72	121	174	52	37	32
19	32	43	56	60	81	100	72	133	146	50	37	32
20	32	56	49	52	81	100	72	110	133	49	34	32
21	32	49	49	46	81	100	81	110	121	48	34	32
22	32	56	46	46	81	110	81	110	121	46	34	32
23	32	49	46	40	81	121	81	110	121	44	34	34
24	32	49	46	40	81	121	90	110	121	43	34	32
25	32	43	46	46	81	121	90	110	100	43	34	34
26	32	43	46	46	81	81	90	100	81	43	34	37
27	32	56	46	68	72	64	90	100	90	43	34	40
28	32	43	46	76	72	72	90	100	90	43	34	37
29	32	56	46	68	....	56	90	100	90	43	34	37
30	32	64	46	76	....	56	90	100	81	37	34	37
31	32	....	46	60	....	64	....	100	....	37	34	....

NOTE.—Discharge determined from a fairly well defined rating curve. Discharge Dec. 22 to 31, 1910, estimated. Gage heights Jan. 1 to Feb. 9, 1911, reduced 0.15 foot before applying open-channel rating curve.

Monthly discharge of East Fork of Deschutes River at Crescent, Oreg., for the year ending Sept. 30, 1911.

[Drainage area, 179 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	56	32	35.7	0.182	0.21	2,200	B.
November	121	32	50.5	.258	.29	3,000	B.
December	110	43	57.0	.291	.34	3,500	B.
January	76	40	51.0	.285	.33	3,140	C.
February	81	30	67.1	.375	.39	3,730	B.
March	121	56	87.1	.487	.56	5,360	B.
April	90	56	74.3	.415	.46	4,420	B.
May	133	81	105	.587	.68	6,460	B.
June	188	81	139	.777	.87	8,270	B.
July	81	37	54.2	.303	.35	3,330	B.
August	37	34	35.8	.200	.23	2,200	B.
September	40	32	34.4	.192	.21	2,050	B.
The year	188	30	65.8	.368	4.92	47,700	

WEST FORK OF DESCHUTES RIVER NEAR LAPINE, OREG.

Location.—At Forest Service bridge in the NW. ¼ sec. 26, T. 20 S., R. 10 E., 4 miles above mouth and 11 miles north of Lapine, Oreg.

Records available.—September 21 to December 21, 1910.

Drainage area.—495 square miles.

Gage.—Vertical staff nailed to bent of bridge.

Channel.—Gravel and sand; probably permanent; tortuous; gradient low.

Discharge measurements.—Made from upper side of bridge.

Winter flow.—Never affected by ice.

Accuracy.—Results fair for days when gage was read.

Cooperation.—Gage readings furnished by United States Forest Service.

Discharge measurements of West Fork of Deschutes River near Lapine, Oreg., in 1910.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Sept. 21	Allen and Davenport	1.50	1,110
Nov. 18	R. W. Davenport	1.16	1,000
Dec. 26	.....do	.96	951

Daily gage height, in feet, and discharge, in second-feet, of West Fork of Deschutes River near Lapine, Oreg., for 1910.

Day.	September.		October.		November.		December.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1								
2							1.25	1,020
3							1.42	1,060
4			1.55	1,090			1.41	1,060
5			1.45	1,070			1.32	1,030
6							1.25	1,020
7							1.22	1,010
8								
9							1.20	1,010
10							1.20	1,010
11								
12							1.18	1,000
13							1.15	1,000
14							1.12	986
15							1.10	980
16							1.10	980
17							1.10	980
18								
19							1.05	970
20								
21							1.00	960
22	1.45	1,070						
23	1.45	1,070						
24								
25			1.25	1,020	1.25	1,020		
26			1.18	1,010	1.18	1,010		
27	1.41	1,060						
28	1.40	1,060						
29	1.40	1,060			1.35	1,040		
30	1.40	1,060			1.40	1,060		
31								

WEST FORK OF DESCHUTES RIVER NEAR LAVA, OREG.

Location.—In the NE. ¼ sec. 24, T. 20 S., R. 10 E., about 1½ miles west of the former Lava post office, 1½ miles above the junction with Deschutes River, or Little River, as it is locally known above the mouth of West Fork.

Records available.—February 20, 1905, to April 14, 1907; April 23, 1909, to January 21, 1911.

Drainage area.—About 500 square miles.

Gage.—Inclined staff on right bank.

Channel.—Gravel and some vegetation at the edges; effect not appreciable. Practically permanent, but backwater from the Deschutes extends up to gage when that river is relatively high.

Discharge measurements.—Made from cable and car 100 yards below the gage.

Winter flow.—Never any ice on this stream.

Accuracy.—Results good, with only slight uncertainties due to effect of backwater.

Discharge measurements of West Fork of Deschutes River near Lava, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910		*Feet.*	*Sec.-ft.*	1911		*Feet.*	*Sec.-ft.*
Nov. 18	R. W. Davenport	8.37	1,040	May 16	R. W. Davenport	8.42	921
Dec. 26	.....do	8.15	950				

Daily gage height, in feet, and discharge, in second-feet, of West Fork of Deschutes River near Lava, Oreg., for the year ending Sept. 30, 1911.

[J. B. Heyburn, observer.]

Day.	October.		November.		December.		January.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	8.6	1,060	8.35	996	8.6	1,060	8.2	962
2	....	1,060	8.35	996	8.7	1,080	8.2	962
3	....	1,060	8.35	996	8.7	1,080	8.1	939
4	....	1,060	8.35	996	8.7	1,080	8.1	939
5	....	1,060	8.35	996	8.6	1,060	8.1	939
6	8.6	1,060	8.35	996	8.5	1,030	8.1	939
7	8.6	1,060	8.35	996	8.5	1,030	8.1	939
8	8.6	1,060	8.6	1,060	8.5	1,030	8.1	939
9	8.6	1,060	8.55	1,040	8.5	1,030	8.1	939
10	8.5	1,030	8.5	1,030	8.5	1,030	8.1	939
11	8.5	1,030	8.45	1,020	8.5	1,030	8.1	939
12	8.5	1,030	8.45	1,020	8.45	1,020	8.1	939
13	8.5	1,030	8.45	1,020	8.45	1,020	8.1	939
14	8.5	1,030	8.4	1,010	8.4	1,010	8.1	939
15	8.5	1,030	8.35	996	8.35	996	8.1	939
16	8.5	1,030	8.3	985	8.3	985	8.1	939
17	8.5	1,030	8.35	996	8.3	985	8.1	939
18	8.5	1,030	8.35	996	8.3	985	8.1	939
19	8.5	1,030	8.35	996	8.3	985	8.1	939
20	8.45	1,020	8.35	996	8.2	963	8.1	939
21	8.45	1,020	8.5	1,030	8.2	963	8.1	939
22	8.45	1,020	8.5	1,030	8.2	963	....	....
23	8.45	1,020	8.65	1,070	8.2	963	....	....
24	8.45	1,020	8.6	1,060	8.2	963	....	....
25	8.45	1,020	8.55	1,040	8.2	963	....	....
26	8.4	1,010	8.55	1,040	8.2	963	....	....
27	8.4	1,010	8.5	1,030	8.2	963	....	....
28	8.4	1,010	8.4	1,010	8.2	963	....	....
29	8.4	1,010	8.6	1,060	8.2	963	....	....
30	8.4	1,010	8.7	1,080	8.2	963	....	....
31	8.35	996	....	....	8.2	963	....	....

NOTE.—Discharge determined from a well-defined rating curve.

Monthly discharge of West Fork of Deschutes River near Lava, Oreg., for the year ending Sept. 30, 1911.

[Drainage area, 500 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	1,060	996	1,030	2.06	2.38	63,300	A.
November	1,080	985	1,020	2.04	2.28	60,700	A.
December	1,080	963	1,000	2.00	2.31	61,500	A.
January 1-21	962	939	941	1.88	1.47	39,200	A.
The period						225,000	

ODELL LAKE OUTLET NEAR CRESCENT, OREG.

Location.—In sec. 26, T. 23 S., R. 6 E., about 18 miles from Crescent and 6 miles from Hoey's ranch.

Records available.—August 5 to September 18, 1911; occasional readings.

Drainage area.—48 square miles.

Gage.—Vertical staff 500 feet below outlet; datum poorly maintained at times.

Channel.—Clean gravel; practically permanent.

Discharge measurements.—Made by wading near the gage.

Winter flow.—Probably unaffected by ice.

Cooperation.—Gage readings furnished by United States Forest Service.

The following discharge measurement was made by R. W. Davenport:

May 13, 1911: Gage height, 0.52 foot; discharge, 74.9 second-feet.

Estimates withheld for additional data.

Daily gage height, in feet, of Odell Lake outlet near Crescent, Oreg., for the year ending Sept. 30, 1911.

Day.	Aug.	Sept.	Day.	Aug.	Sept.	Day.	Aug.	Sept.
1			11			21		
2			12	0.28		22		
3		0.19	13			23	0.20	
4			14		0.30	24		
5	0.30		15	.20		25		
6			16			26		
7			17			27		
8			18		.20	28	.17	
9	.25		19	.18		29		
10		.35	20			30		
						31	.17	

TUMALO CREEK NEAR LAIDLAW, OREG.

Location.—In sec. 3, T. 18 S., R. 10 E. 300 feet above intake of Wimer ditch, and about 1½ miles above intake of Columbia Southern canal, and 15 miles from Laidlaw.

Records available.—May 15, 1906, to September 30, 1911, irrigating season only; records during winter kept at lower station near Bend.

Drainage area.—48 square miles.

Gage.—Vertical staff; present gage installed April 20, 1910; during 1906 and 1907 gage was located in sec. 2, half a mile above headgate of Columbia Southern canal and below Wimer canal.

Channel.—Gravel and large rocks; fairly permanent.

Discharge measurements.—Made from a foot log or by wading.

Winter flow.—Practically no records during winter period.

Accuracy.—Rating curve well defined; open-channel estimates good.

Diversions.—Present station is above all diversions; earlier station was below intake of Wimer canal, discharge of which has been added to give the total for the creek.

Cooperation.—Station maintained in cooperation with Columbia Southern Irrigation Co.

Discharge measurements of Tumalo Creek near Laidlaw, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Nov. 15	R. W. Davenport......	3.54	86	May 19	R. W. Davenport......	3.66	103

Daily gage height, in feet, and discharge, in second-feet, of Tumalo Creek near Laidlaw, Oreg., for the year ending Sept. 30, 1911.

[C. A. Reeves, observer.]

Day.	April.		May.		June.		July.		August.		September.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	3.60	98	3.70	119	4.25	258	4.05	204	3.50	79	3.45	72
2	......	96	3.73	126	4.25	258	3.85	154	3.45	72	3.40	64
3	......	93	3.74	128	4.20	244	4.20	244	3.40	64	3.40	64
4	......	90	3.77	135	4.20	244	4.15	230	3.60	98	3.45	72
5	3.55	88	3.80	142	4.20	244	4.15	230	3.50	79	3.45	72
6	3.55	88	3.75	130	4.20	244	4.05	204	3.55	88	3.45	72
7	3.55	88	3.75	130	4.35	284	4.00	191	3.50	79	3.45	72
8	3.55	88	3.76	132	4.30	271	3.85	154	3.45	72	3.45	72
9	......	86	3.71	121	4.35	284	3.78	137	3.45	72	3.50	79
10	......	84	3.69	117	4.40	298	3.75	130	3.45	72	3.45	72
11	......	81	3.70	119	4.50	326	3.73	126	3.45	72	3.45	72
12	3.50	79	3.76	132	4.75	396	3.75	130	3.45	72	3.40	64
13	......	79	3.71	121	4.70	382	3.92	171	3.45	72	3.45	72
14	......	79	3.70	119	4.75	396	3.92	171	3.45	72	3.40	64
15	......	79	3.70	119	4.60	354	3.92	171	3.45	72	3.50	79
16	3.50	79	3.71	121	4.55	340	3.98	186	3.45	73	3.45	72
17	......	82	3.72	124	4.30	271	3.95	178	3.45	72	3.40	64
18	......	85	3.71	121	4.40	298	3.90	166	3.45	72	3.40	64
19	......	88	3.65	108	4.30	271	3.85	154	3.45	72	3.40	64
20	......	89	3.65	108	4.30	271	3.65	108	3.45	72	3.40	64
21	......	92	3.72	124	4.30	271	3.60	98	3.45	72	3.40	64
22	......	95	3.80	142	4.20	244	3.55	88	3.45	72	3.40	64
23	3.60	98	3.81	144	4.05	204	3.52	83	3.45	72	3.40	64
24	......	114	3.78	137	3.92	171	3.52	83	3.40	64	3.40	64
25	3.75	130	3.72	124	3.92	171	3.50	79	3.40	64	3.40	64
26	......	127	3.70	119	4.15	230	3.55	88	3.40	64	3.45	72
27	3.72	124	3.75	130	4.20	244	3.50	79	3.40	64	3.40	64
28	......	122	3.84	152	4.00	191	3.50	79	3.40	64	3.40	64
29	3.70	119	3.96	178	4.00	191	3.50	79	3.40	64	3.40	64
30	......	119	3.96	178	3.92	171	3.50	79	3.40	64	3.40	64
31	......	....	4.20	244	....	....	3.50	79	3.45	72	....	....

NOTE.—Discharge determined from a rating curve well defined between 70 and 180 second-feet.

Monthly discharge of Tumalo Creek near Laidlaw, Oreg., for the year ending Sept. 30, 1911.

[Drainage area, 48 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October			92.3	1.92	2.14	5,690	C.
November			87.0	1.81	2.02	5,180	C.
December			111	2.31	2.66	6,820	C.
January			82.3	1.71	1.97	5,060	C.
February			90.7	1.89	1.97	5,040	C.
March			63.0	1.31	1.51	3,870	C.
April	130	79	95.3	1.99	2.22	5,670	A.
May	244	108	134	2.79	3.22	8,240	A.
June	396	171	267	5.56	6.20	15,900	B.
July	244	79	140	2.92	3.37	8,610	A.
August	98	64	72.0	1.50	1.73	4,430	A.
September	79	64	67.9	1.41	1.57	4,040	A.
The year			109	2.27	30.58	78,500	

NOTE.—Discharge October to March estimated from occasional readings at the lower Tumalo Creek station, and by comparison with Squaw Creek near Sisters, Oreg.

WIMER CANAL NEAR LAIDLAW, OREG.

Location.—In sec. 2, T. 18 S., R. 10 E., about 15 miles from Laidlaw, half a mile below the intake, and below controlling spillway.

Records available.—1906 to 1911. Those for 1906–7 were just below intake and above controlling spillway.

Gage.—Vertical staff; no change in datum since April 1, 1908.

Channel.—Flume.

Discharge measurements.—Made by wading or from yoke of flume.

Winter flow.—Not operated during the season of ice.

Accuracy.—Sufficient measurements not made to determine possible changes in rating. . Results fair.

Cooperation.—Station maintained in cooperation with the Columbia Southern Irrigation Co.

The following discharge measurement was made by R. W. Davenport:

November 15, 1910: Gage height, 0.60 foot; discharge, 5.3 second-feet.

Daily gage height, in feet, of Wimer canal near Laidlaw, Oreg., for 1911.

[C. A. Reeves, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	....	1.35	1.20	1.55	1.45	1.20	1.20
2	....	1.38	1.20	1.56	1.45	1.20	1.10
3	....	1.38	1.20	1.58	1.40	1.20	1.10
4	....	1.38	1.18	1.60	1.40	1.20	1.10
5	....	1.40	1.18	1.60	1.40	1.20	1.00
6	....	1.40	1.20	1.65	1.45	1.20	1.10
7	0.90	1.40	1.20	1.60	1.40	1.20	1.10
8	1.00	1.40	1.20	1.43	1.35	1.20	1.10
9	1.00	1.40	1.20	1.40	1.35	1.20	1.10
10	.98	1.39	1.20	1.40	1.35	1.20	1.10
11	.95	1.40	1.25	1.55	1.35	1.20	1.10
12	.95	1.40	....	1.51	1.35	1.20	1.10
13	.95	1.40	....	1.60	1.20	1.20	1.10
14	.94	1.40	....	1 60	1 20	1.20	1.10
15	1.02	1.40	1.45	1.60	1.20	1.20	1.10
16	1.05	1.40	1.46	1.60	1.20	1.20	1.10
17	1.15	1.40	1.40	1.60	1.20	1.20	1.10
18	1.18	1.40	1.40	1.60	1.20	1.20	1.10
19	1.16	1.10	1.30	1.60	1.20	1.20	1.10
20	1.16	1.10	1.32	1.50	1.20	1.20	.80
21	1.18	1.20	1.33	1.45	1.20	1.20	.80
22	1.18	1.20	1.45	1.50	1.20	1.20	.80
23	1.18	1.25	1.30	1.45	1.20	1.20	.80
24	1.19	1.22	1.40	1.45	1.20	1.20	.80
25	1.21	1.20	1.40	1.40	1.20	1.20	.80
26	1.35	1.20	1.45	1.50	1.20	1.20	.80
27	1.35	1.22	1.45	1.50	1.20	1.20	.80
28	1.35	1.25	1.40	1.50	1.20	1.20	.80
29	1.35	1.30	1.35	1.50	1.20	1.20	.80
30	1.35	1.25	1.30	1.50	1.20	1.20	.80
31	....	1.25	....	1.50	1.25	....	.80

Daily discharge, in second-feet, of Wimer canal near Laidlaw, Oreg., for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	....	22	18	28	26	18	18
2	....	23	18	29	26	18	15
3	....	23	18	29	24	18	15
4	....	23	17	30	24	18	15
5	....	24	17	30	24	18	13
6	....	24	18	32	26	18	15
7	11	24	18	30	24	18	15
8	13	24	18	25	22	18	15
9	13	24	18	24	22	18	15
10	13	24	18	24	22	18	15
11	12	24	20	28	22	18	15
12	12	24	0	27	22	18	15
13	12	24	0	30	18	18	15
14	12	24	0	30	18	18	15
15	13	24	26	30	18	18	15
16	14	24	26	30	18	18	15
17	16	24	24	30	18	18	15
18	17	24	24	30	18	18	15
19	17	15	21	30	18	18	15
20	17	15	22	27	18	18	9
21	17	18	22	26	18	18	9
22	17	18	26	27	18	18	9
23	17	20	21	26	18	18	9
24	18	19	24	26	18	18	9
25	18	18	24	24	18	18	9
26	22	18	26	27	18	18	9
27	22	19	26	27	18	18	9
28	22	20	24	27	18	18	9
29	22	21	22	27	18	18	9
30	22	20	21	27	18	18	9
31	....	20	....	27	20	....	9

NOTE.—Discharge determined from a well-defined rating curve.

Monthly discharge of Wimer canal near Laidlaw, Oreg., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April 7-30	22	11	16.2	771	B.
May	24	15	21.5	1,320	B.
June	26	0	19.2	1,140	B.
July	32	24	27.9	1,720	B.
August	26	18	20.3	1,250	B.
September	18	18	18.0	1,070	B.
October	18	9	12.7	781	B.
The period				8,050	

COLUMBIA SOUTHERN CANAL NEAR LAIDLAW, OREG.

Location.—In sec. 2, T. 18 S., R. 10 E., one-fourth mile below head gates and about 15 miles southwest of Laidlaw.

Records available.—1906 to 1911, irrigating season.

Gage.—Vertical staff on upstream side of wasteway.

Channel.—Flume.

Discharge measurements.—Made by wading, or from foot log near gage.

Winter flow.—Not operated during season of ice.

Accuracy.—Records somewhat uncertain on account of insufficient measurements to detect possible changes in channel below the flume.

Cooperation.—Gage readings furnished by the Columbia Southern Irrigation Co.

Discharge measurements of Columbia Southern canal near Laidlaw, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Nov. 15	R. W. Davenport	0.63	[a] 2.5	May 19	R. W. Davenport	1.88	65.5

[a] Discharge estimated.

Daily gage height, in feet, of Columbia Southern canal near Laidlaw, Oreg., for 1911.

[C. A. Reeves, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	1.45	1.72	2.15	2.30	1.65	1.65	1.65
2	1.45	1.72	2.15	2.25	1.60	1.65	1.50
3	1.45	1.80	2.15	2.30	1.65	1.65	1.50
4	1.45	1.80	2.15	2.30	1.65	1.73	1.50
5	1.45	1.82	2.20	2.30	1.65	1.70	1.65
6	1.45	1.80	2.20	2.30	1.65	1.65	1.60
7	1.43	1.85	2.15	2.30	1.65	1.65	1.60
8	1.45	1.90	2.20	2.00	1.65	1.65	1.65
9	1.43	1.95	2.20	2.25	1.65	1.75	1.60
10	1.42	1.92	2.15	2.25	1.65	1.65	1.60
11	1.43	1.92	2.20	2.25	1.65	1.65	1.60
12	1.48	1.91	2.20	2.30	1.65	1.65	1.60
13	1.45	1.92	2.15	2.30	1.70	1.65	1.60
14	1.45	1.92	2.20	2.25	1.70	1.65	1.60
15	1.45	2.00	2.20	2.25	1.70	1.85	1.60
16	1.45	2.00	2.20	2.30	1.70	1.65	1.60
17	1.45	2.00	2.20	2.30	1.65	1.60	1.60
18	1.45	2.00	2.25	2.25	1.65	1.65	1.60
19	1.45	1.95	2.25	2.25	1.65	1.60	1.60
20	.00	1.95	2.20	2.05	1.65	1.65	1.65
21	.00	1.95	2.20	1.95	1.65	1.60	1.60
22	.00	1.95	2.30	1.85	1.65	1.65	1.45
23	1.45	2.00	2.25	1.80	1.65	1.65	1.45
24	1.60	2.00	2.30	1.80	1.60	1.60	1.45
25	1.60	2.00	2.25	1.80	1.65	1.65	1.45
26	1.70	2.00	2.30	1.80	1.60	1.70	1.45
27	1.71	2.00	2.30	1.80	1.65	1.65	1.45
28	1.73	2.00	2.20	1.70	1.65	1.60	1.45
29	1.72	2.05	2.20	1.75	1.65	1.65	1.45
30	1.72	2.05	2.25	1.70	1.65	1.60	1.40
31		2.10		1.70	1.70		1.40

Daily discharge, in second-feet, of Columbia Southern canal near Laidlaw, Oreg., for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	38	61	98	119	45	45	45
2	38	61	98	112	41	45	34
3	38	69	98	119	45	45	34
4	38	69	98	119	45	52	34
5	38	71	105	119	45	49	45
6	38	69	105	119	45	45	41
7	36	74	98	119	45	45	41
8	38	79	105	79	45	45	45
9	36	85	105	112	45	54	41
10	36	81	98	112	45	45	41
11	36	81	105	112	45	45	41
12	40	80	105	119	45	45	41
13	38	81	98	119	49	45	41
14	38	81	105	112	49	45	41
15	38	91	105	112	49	63	41
16	38	91	105	119	49	45	41
17	38	91	105	119	45	41	41
18	38	79	112	112	45	45	41
19	38	74	112	112	45	41	41
20	0	74	105	85	45	45	45
21	0	74	105	74	45	41	41
22	0	74	119	63	45	45	31
23	38	79	112	58	45	45	31
24	50	79	119	58	41	41	31
25	50	79	112	58	45	45	31
26	59	79	119	58	41	49	31
27	60	79	119	58	45	45	31
28	62	79	105	49	45	41	31
29	61	85	105	54	45	45	31
30	61	85	112	49	45	41	28
31	....	91	....	49	49	....	28

NOTE.—Discharge determined from a fairly well-defined rating curve.

Monthly discharge of Columbia Southern canal near Laidlaw, Oreg., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April	62	0	38.6	2,300	B.
May	91	61	78.2	4,810	B.
June	119	98	106	6,310	B.
July	119	49	92.8	5,710	B.
August	49	41	45.3	2,790	B.
September	63	41	45.6	2,710	B.
October	45	28	37.4	2,300	B.
The period	....	....	....	26,900	

TUMALO CREEK NEAR BEND, OREG.

Location.—In the SE. ¼ sec. 23, T. 17 S., R. 11 E., half a mile below highway bridge on Bend-Sisters road, 4 miles above mouth.

Records available.—October 6, 1906, to February 23, 1911 (fragmentary). This station is maintained in winter months to insure a year-long record on the stream The upper station is somewhat isolated and sometimes inaccessible in winter.

Drainage area.—57 square miles.

Gage.—Vertical staff, nailed to overhanging stump, since November, 1910; previous records at different site.

Channel.—Rocks and gravel; not liable to shift greatly.

Discharge measurements.—At ordinary stages made by wading near the gage; at flood stages, from the highway bridge, half a mile above gage.

Winter flow.—Gage heights have been considerably affected during extreme cold weather.

Diversions.—All the water of this stream diverted above station during the irrigation season, making it dry except for seepage return.

Accuracy.—An accurate open-channel curve has been developed, applicable except during extreme high water.

The following discharge measurement was made by R. W. Davenport:

November 15, 1910: Gage height, 1.44 feet; discharge, 77 second-feet.

Daily gage height, in feet, and discharge, in second-feet, of Tumalo Creek near Bend, Oreg., for the year ending Sept. 30, 1911.

[F. N. Wallace, observer.]

Day.	November.		December.		January.		February.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1								
2								
3	1.32	59			1.45	78	1.50	87
4								
5								
6								
7								
8								
9								
10							1.56	98
11			1.65	116				
12								
13	1.40	70			1.50	87		
14								
15	1.44	77						
16								
17			1.72	130				
18								
19								
20								
21								
22								
23							1.50	87
24								
25								
26					1.47	82		
27			1.50	87				
28								
29								
30	1.45	78						
31								

NOTE.—Discharge determined from a fairly well defined rating curve. Daily discharges used to determine monthly discharge at upper Tumalo Creek station.

SQUAW CREEK NEAR SISTERS, OREG.

Location.—In sec. 30, T. 15 S., R. 10 E., about 4 miles above Sisters and above all diversions except McAllister's ditch.

Records available.—July 1, 1906, to September 30, 1911.

Drainage area.—63 square miles.

Gage.—Vertical staff.

Channel.—Gravel and rock; practically permanent. Backwater from a changeable dam reaches the gage and introduces changes in the rating curve.

Discharge measurements.—Made from a foot log just above the gage.

Winter flow.—Ice tends to jam above the dam, and during extreme cold weather the effect is very marked.

Diversions.—McAllister's ditch heads above this station and its flow is added to get the total. The low-water flow of the stream is all diverted by several irrigation ditches below the station.

Accuracy.—Records for 1910–11 are good; those for previous years are subject to considerable error.

Discharge measurements of Squaw Creek near Sisters, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Nov. 12	R. W. Davenport......	3.24	97.0	June 2	R. W. Davenport......	3.49	147

Daily gage height, in feet, of Squaw Creek near Sisters, Oreg., for the year ending Sept. 30, 1911.

[Samuel Wiehl, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	3.05	2.9	3.2	3.05	2.9	3.95	3.0	3.15	3.4	3.5	3.6	3.25
2	3.0	2.9	3.25	3.0	2.95	3.8	3.0	3.2	3.5	3.6	3.5	3.3
3	3.8	2.9	3.25	3.0	3.45	3.2	3.0	3.2	3.5	3.6	3.45	3.3
4	3.45	2.85	3.3	2.95	3.4	3.1	3.0	3.3	3.45	3.7	3.45	3.2
5	3.25	2.85	3.25	2.95	2.9	3.0	3.0	3.3	3.45	3.85	3.4	3.15
6	3.2	2.85	3.25	2.95	3.5	2.9	3.0	3.25	3.5	4.0	3.4	3.15
7	3.2	2.9	3.2	2.95	3.45	2.9	3.0	3.25	3.55	3.95	3.35	3.1
8	3.15	3.75	3.2	2.95	3.5	2.9	3.0	3.2	3.55	3.8	3.45	3.1
9	3.1	4.0	3.15	2.95	3.4	2.9	3.0	3.15	3.6	3.65	3.45	3.1
10	3.1	3.8	3.15	2.95	2.9	2.85	3.0	3.1	3.8	3.6	3.4	3.1
11	3.1	3.45	3.1	2.95	2.9	2.85	3.0	3.1	3.9	3.6	3.4	3.1
12	3.15	3.3	3.1	3.0	2.9	2.9	2.9	3.2	4.0	3.7	3.4	3.1
13	3.1	3.25	3.1	3.0	2.9	2.9	2.9	3.15	4.0	3.7	3.3	3.1
14	3.0	3.2	3.1	2.9	2.9	2.9	3.2	3.1	4.0	3.75	3.35	3.1
15	3.0	3.15	3.1	3.35	2.95	2.9	2.9	3.1	4.0	3.85	3.3	3.2
16	3.0	3.1	3.05	3.5	3.1	2.9	2.95	3.1	4.0	3.9	3.3	3.2
17	3.1	3.05	3.05	3.4	3.4	2.9	2.95	3.15	3.95	4.1	3.3	3.1
18	3.15	3.05	3.05	3.1	3.5	2.9	2.95	3.15	3.9	4.0	3.35	3.05
19	3.1	3.05	3.1	3.0	3.8	2.9	2.95	3.15	3.9	3.9	3.35	3.0
20	3.05	3.05	3.1	3.2	3.0	2.9	3.0	3.2	3.8	3.8	3.3	3.0
21	3.0	3.4	3.1	3.1	3.1	2.95	3.0	3.2	3.8	3.8	3.2	3.0
22	3.0	3.35	3.05	3.1	3.0	2.95	3.05	3.2	3.75	3.65	3.2	3.0
23	3.0	3.25	3.05	3.05	3.0	2.95	3.05	3.15	3.75	3.55	3.2	3.0
24	3.0	3.15	3.05	3.05	3.0	2.95	3.1	3.15	3.55	3.55	3.2	3.0
25	3.0	3.1	3.05	3.05	3.15	2.9	3.2	3.15	3.6	3.55	3.2	3.0
26	2.95	3.1	3.1	3.5	3.2	2.9	3.2	3.15	3.9	3.5	3.2	3.0
27	2.95	3.15	3.1	3.2	3.2	2.9	3.2	3.15	4.0	....	3.2	3.0
28	2.95	3.3	3.1	3.15	3.4	2.9	3.15	3.15	3.9	3.5	3.2	3.0
29	2.95	3.3	3.0	3.15	....	2.95	3.15	3.2	3.65	3.6	3.2	3.0
30	2.95	3.2	3.0	3.1	....	2.95	3.15	3.2	3.6	....	3.25	3.0
31	2.95	....	3.0	3.1	....	3.0	....	3.35	....	....	3.25	....

NOTE.—Gage heights of Jan. 15 to 17, 20, 26 to 31, Feb. 2 to 4, 6 to 9, 15 to 19, 25 to 28, and Mar. 1 to 5 affected by ice.

Daily discharge, in second-feet, of Squaw Creek near Sisters, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	68	47	93	68	47	54	60	84	132	155	180	102
2	60	47	102	60	47	53	60	93	155	180	155	112
3	238	47	102	60	47	51	60	93	155	180	144	112
4	144	41	112	54	47	50	60	112	144	208	144	93
5	102	41	102	54	47	48	60	112	144	253	132	84
6	93	41	102	54	47	47	60	102	155	300	132	84
7	93	47	93	54	47	47	60	102	168	284	122	76
8	84	223	93	54	47	47	60	93	168	238	144	76
9	76	300	84	54	47	47	60	84	180	194	144	76
10	76	238	84	54	47	41	60	76	238	180	132	76
11	76	144	76	54	47	41	60	76	268	180	132	76
12	84	112	76	60	47	47	47	93	300	208	132	76
13	76	102	76	60	47	47	47	84	300	208	112	76
14	60	93	76	47	47	47	93	76	300	223	122	76
15	60	84	76	54	49	47	47	76	300	253	112	93
16	60	76	68	62	51	47	54	76	300	268	112	93
17	76	68	68	69	54	47	54	84	284	334	112	76
18	84	68	68	76	56	47	54	84	268	300	122	68
19	76	68	76	60	58	47	54	84	268	268	122	60
20	68	68	76	68	60	47	60	93	238	238	112	60
21	60	132	76	76	76	54	60	93	238	238	93	60
22	60	122	68	76	60	54	68	93	223	194	93	60
23	60	102	68	68	60	54	68	84	223	168	93	60
24	60	84	68	68	60	54	76	84	168	168	93	60
25	60	76	68	68	59	47	93	84	180	168	93	60
26	54	76	76	65	58	47	93	84	268	155	93	60
27	54	84	76	62	57	47	93	84	300	155	93	60
28	54	112	76	59	55	47	84	84	208	155	93	60
29	54	112	60	56	....	54	84	93	194	180	93	60
30	54	93	60	53	....	54	84	93	180	180	102	60
31	54	....	60	50	....	60	....	122	....	180	102	....

NOTE.—Discharge determined from a rating curve well defined between 60 and 160 second-feet. Discharge interpolated during periods when gage heights were affected by ice.

Monthly discharge of Squaw Creek and McAllister's ditch near Sisters, Oreg., for the year ending Sept. 30, 1911.

Month.	Squaw Creek.				McAllister's ditch.			
	Discharge in second-feet.			Run-off (total in acre-feet).	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.		Maximum.	Minimum.	Mean.	
October	238	54	76.7	4,720	11.5	3.1	4.49	276
November	300	41	98.3	5,850	6.6	2.2	3.42	204
December	112	60	79.3	4,880	3.1	2.2	2.25	138
January	76	47	60.5	3,720	5.3	.0	1.16	71
February	76	47	52.5	2,920	....	....	.00	0
March	60	41	49.1	3,020	3.6	.0	1.28	79
April	93	47	65.8	3,920	4.2	2.2	2.72	162
May	122	76	89.5	5,500	6.0	3.6	4.29	264
June	300	132	224	13,300	18	8.1	13.2	786
July	334	155	213	13,100	13	7.4	9.57	588
August	180	93	118	7,260	14	4.2	5.76	354
September	112	60	74.8	4,450	6.6	1.0	5.63	335
The year	334	41	100	72,600	18	0.0	4.50	3,260

Monthly discharge of Squaw Creek, including McAllister's ditch, near Sisters, Oreg., for the year ending Sept. 30, 1911.

[Drainage area, 63 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	250	57.1	81.2	1.29	1.49	4,990	A.
November	307	43.6	102	1.62	1.81	6,070	A.
December	115	62.2	81.6	1.30	1.50	5,020	B.
January	76.0	52.3	61.7	.979	1.13	3,790	C.
February	76.0	47.0	52.5	.833	.87	2,920	C.
March	62.2	41.6	50.4	.800	.92	3,100	B.
April	97.2	49.2	68.5	1.09	1.22	4,060	A.
May	128	79.6	93.8	1.49	1.72	5,770	A.
June	313	144	237	3.76	4.20	14,100	B.
July	344	163	223	3.54	4.08	13,700	B.
August	194	97.2	124	1.97	2.27	7,620	A.
September	117	65.3	80.4	1.28	1.43	4,780	A.
The year	344	41.6	105	1.67	22.64	75,900	

McALLISTER'S DITCH NEAR SISTERS, OREG.

Location.—About 100 yards below intake, in the SW. ¼ sec. 30, T. 15 S., R. 10 E., above first spillway.

Records available.—May 2 to November 22, 1909; June 29, 1910, to September 30, 1911.

Gage.—Vertical staff in side of ditch.

Channel.—Earth section of canal.

Discharge measurements.—From crosspiece of waste gate or by wading.

Winter flow.—Water shut off in freezing weather.

Accuracy.—Results 1909–1911 are subject to much uncertainty because of infrequent measurements and changes in conditions. Gage heights also were liable to be affected by changes in the wasteway just below the station.

Discharge measurements of McAllister's ditch near Sisters, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Nov. 12	R. W. Davenport	1.01	4.2	June 2	R. W. Davenport	1.37	9.14

Daily gage height, in feet, of McAllister's ditch near Sisters, Oreg., for the year ending Sept. 30, 1911.

[Samuel Wiehl, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.9	0.9	0.8	0.9	....	0.8	1.0	1.5	1.3	1.65	1.05
2	.9	.9	.85	.8	....	.8	1.0	1.75	1.35	1.65	1.1
3	1.5	.9	.85	.8	....	.8	1.05	1.75	1.35	1.65	1.1
4	1.3	.85	.9	.9	....	.85	1.1	1.75	1.35	1.1	1.05
5	1.2	.85	.8	.9	....	.85	1.1	1.75	1.45	1.1	1.0
6	1.15	.85	.8	.8	....	.85	1.05	1.8	1.45	1.1	1.2
7	1.1	.9	.8	.75	....	.85	1.05	1.8	1.4	1.1	1.2
8	1.05	1.1	.8	.75	....	.85	1.05	1.8	1.35	1.15	1.2
9	1.0	1.2	.8	.7	0.55	.8	1.0	1.8	1.3	1.15	1.2
10	1.0	1.15	.8	.7	.5	.8	.95	1.8	1.3	1.1	1.2
11	1.0	1.05	.8	.75	.5	.8	.95	1.7	1.3	1.1	1.2
12	1.05	1.0	.8	.8	.5	.8	1.05	1.6	1.3	1.1	1.2
13	1.0	1.0	.8	1.0	.5	.8	.95	1.6	1.3	1.05	1.2
14	.9	.95	.8	1.1	.5	.8	.95	1.55	1.3	1.1	1.2
15	.9	.95	.8	....	.5	.8	.95	1.55	1.35	1.05	1.2
16	.9	.9	.8	....	.5	.8	.95	1.55	1.35	1.05	1.2
17	.95	.9	.8	....	.7	.8	1.0	1.5	1.4	1.05	1.2
18	1.0	.9	.8	....	.7	.8	1.0	1.5	1.4	1.05	.6
19	1.0	.9	.95	....	.7	.8	1.0	1.5	1.4	1.1	1.1
20	1.0	.9	.95	....	.85	.8	1.0	1.45	1.4	1.05	1.1
21	.9	.9	.95	....	.9	.8	1.05	1.45	1.35	1.0	1.1
22	.95	.9	.95	....	.95	.85	1.05	1.5	1.3	1.0	1.1
23	.95	.9	.95	....	.95	.85	1.0	1.5	1.25	1.0	1.1
24	.95	.9	.95	....	.95	.9	1.0	1.35	1.3	1.0	1.1
25	.95	.9	.95	....	.9	1.0	.95	1.35	1.5	1.0	1.1
26	.9	.9	1.1	....	.7	1.0	.95	1.45	1.5	1.0	1.15
27	.95	.9	1.1	....	.7	1.0	.95	1.5	....	1.0	1.1
28	.95	.8	1.1	....	.7	1.0	.95	1.45	1.5	1.0	1.1
29	.9	.8	.8	....	.75	1.0	1.0	1.4	1.6	1.05	1.1
30	.95	.8	.8	....	.8	....	1.05	1.3	....	1.05	1.1
31	.95	....	.8	....	.8	....	1.15	....	....	1.05	....

Daily discharge, in second-feet, of McAllister's ditch near Sisters, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	5.9	3.1	2.2	3.1	0.0	0.0	2.2	4.2	11.5	8.1	14	4.8
2	5.9	3.1	2.6	2.2	.0	.0	2.2	4.2	17	8.9	14	5.3
3	11.5	3.1	2.6	2.2	.0	.0	2.2	4.8	17	8.9	14	5.3
4	8.1	2.6	3.1	3.1	.0	.0	2.6	5.3	17	8.9	5.3	4.8
5	6.6	2.6	2.2	3.1	.0	.0	2.6	5.3	17	10.6	5.3	4.2
6	6.0	2.6	2.2	2.2	.0	.0	2.6	4.8	18	10.6	5.3	6.6
7	5.3	3.1	2.2	1.8	.0	.0	2.6	4.8	18	9.6	5.3	6.6
8	4.8	5.3	2.2	1.8	.0	.0	2.6	4.8	18	8.9	6.0	6.6
9	4.2	6.6	2.2	1.5	.0	.8	2.2	4.2	18	8.1	6.0	6.6
10	4.2	6.0	2.2	1.5	.0	.6	2.2	3.6	18	8.1	5.3	6.6
11	4.2	4.8	2.2	1.8	.0	.6	2.2	3.6	16	8.1	5.3	6.6
12	4.8	4.2	2.2	2.2	.0	.6	2.2	4.8	13	8.1	5.3	6.6
13	4.2	4.2	2.2	4.2	.0	.6	2.2	3.6	13	8.1	4.8	6.6
14	3.1	3.6	2.2	5.3	.0	.6	2.2	3.6	12.4	8.1	5.3	6.6
15	3.1	3.6	2.2	.0	.0	.6	2.2	3.6	12.4	8.9	4.8	6.6
16	3.1	3.1	2.2	.0	.0	.6	2.2	3.6	12.4	8.9	4.8	6.6
17	3.6	3.1	2.2	.0	.0	1.5	2.2	4.2	11.5	9.6	4.8	6.6
18	4.2	3.1	2.2	.0	.0	1.5	2.2	4.2	11.5	9.6	4.8	1.0
19	4.2	3.1	2.2	.0	.0	1.5	2.2	4.2	11.5	9.6	5.3	5.3
20	4.2	3.1	2.2	.0	.0	2.6	2.2	4.2	10.6	9.6	4.8	5.3
21	3.1	3.1	2.2	.0	.0	3.1	2.2	4.8	10.6	8.9	4.2	5.3
22	3.6	3.1	2.2	.0	.0	3.6	2.6	4.8	11.5	8.1	4.2	5.3
23	3.6	3.1	2.2	.0	.0	3.6	2.6	4.2	11.5	7.4	4.2	5.3
24	3.6	3.1	2.2	.0	.0	3.6	3.1	4.2	8.9	8.1	4.2	5.3
25	3.6	3.1	2.2	.0	.0	3.1	4.2	3.6	8.9	11.5	4.2	5.3
26	3.1	3.1	2.2	.0	.0	1.5	4.2	3.6	10.6	11.5	4.2	6.0
27	3.6	3.1	2.2	.0	.0	1.5	4.2	3.6	11.5	11.5	4.2	5.3
28	3.6	2.6	2.2	.0	.0	1.5	4.2	3.6	10.6	11.5	4.2	5.3
29	3.1	2.2	2.2	.0	....	1.8	4.2	4.2	9.7	13	4.8	5.3
30	3.6	2.2	2.2	.0	....	2.2	4.2	4.8	8.1	13	4.8	5.3
31	3.6	....	2.2	.0	....	2.2	....	6.0	....	13	4.8	....

NOTE.—Discharge determined from a poorly defined rating curve. These discharges have been added to those at Squaw Creek station to give total flow. Discharge estimated Dec. 19 to 28; ditch frozen over. Water turned out of ditch Jan. 15 to March 8.

CROOKED RIVER NEAR POST, OREG.

Location.—In sec. 7, T. 17 S., R. 21 E., 12 miles above Post, and half a mile below mouth of North Fork of Crooked River, at a point locally known as Stewart's Grade, just below dam site of proposed reservoir.

Records available.—November 9, 1909, to August 27, 1911.

Drainage area.—1,390 square miles.

Gage.—Combination vertical staff and inclined staff. Vertical staff read at low water; datum lowered 1 foot October 22, 1909; all gage heights for 1909 reduced to new datum.

Channel.—Rocks and bowlders; probably permanent.

Discharge measurements.—Made from cable and car at gage section; very poor.

Winter flow.—Stream freezes and water sometimes flows over ice; gage height affected for two or three months each winter. Estimates of discharge during such periods have generally been made by comparison with records of Prineville station.

Diversions.—A considerable and unknown amount of water is diverted for irrigation above the station.

Accuracy.—Results only fair on account of unfavorable conditions.

Discharge measurements of Crooked River near Post, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Nov. 2	R. W. Davenport......	0.94	48	Mar. 9	R. W. Davenport......	3.36	657
Dec. 6	.....do.................	2.06	284				

Daily gage height, in feet, of Crooked River near Post, Oreg., for the year ending Sept. 30, 1911.

[E. A. Stewart, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1	0.80	0.92	3.00	2.70	3.2	2.80	....	....	....	....	....
2	.80	.95	2.85	2.80	3.1	2.80	....	....	1.20	....	....
3	.80	.95	3.35	2.85	3.0	3.0	....	....	....	....	....
4	.80	.95	....	2.85	2.90	3.2	....	....	1.20	....	....
5	.82	.98	....	2.85	2.80	5.2	3.9	....	....	....	....
6	.85	1.00	....	2.85	2.80	5.2	3.8	....	....	....	....
7	.86	1.08	....	2.85	2.80	6.0	3.9	2.05	....	....	....
8	.90	1.22	....	2.85	2.80	4.0	3.9	....	1.00	....	0.57
9	.92	1.22	....	1.80	2.80	3.4	3.9	....	....	....	....
10	.93	1.21	....	1.90	2.80	3.3	3.7	....	....	....	....
11	....	1.20	3.15	2.00	2.80	3.3	3.4	....	.90	....	....
12	....	1.25	3.30	2.40	2.80	3.3	3.2	....	....	....	....
13	....	1.22	3.65	2.40	2.80	3.3	....	....	....	....	.55
14	1.00	1.19	....	2.40	2.80	3.5	3.1	1.80	....	....	.58
15	.98	1.16	1.40	2.40	2.80	3.7	3.0	....	....	....	....
16	.97	1.15	1.00	2.40	2.80	3.9	2.85	1.80	....	....	....
17	....	1.13	.85	2.40	2.80	4.1	3.1	....	.70	....	....
18	....	1.11	.60	2.40	2.80	4.1	3.0	....	....	....	....
19	.91	1.11	.70	2.40	2.80	4.2	2.90	2.05	....	....	.42
20	.91	1.28	.80	2.50	2.80	4.3	....	....	....	....	....
21	.90	....	.95	2.40	2.80	4.9	....	1.90	....	....	....
22	.90	1.80	1.10	2.40	2.80	5.3	3.0	....	....	....	....
23	.90	....	1.20	2.40	2.80	5.8	....	....	....	0.35	....
24	.91	....	1.40	2.40	2.80	5.3	....	....	....	....	....
25	.91	1.65	1.60	2.40	2.80	4.8	....	....	....	....	.35
26	.90	1.50	1.70	2.40	2.80	4.6	....	1.70	....	....	....
27	.90	....	2.00	2.40	2.80	4.4	....	....	....	....	.34
28	.89	....	2.20	2.40	2.80	4.2	....	1.55	....	....	....
29	.89	....	2.37	2.45	....	4.2	....	....	....	....	....
30	.89	3.20	2.50	2.60	....	....	2.40	....	....	.60	....
31	.89	....	2.60	3.5	....	....	....	....	....	....	....

NOTE.—River frozen over Nov. 21, 1910, to Mar. 7, 1911; gage heights seriously affected by ice.

Daily discharge, in second-feet, of Crooked River near Post, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Mar.	Apr.	May.	June.	July.	Aug.
1	36	48	94	2,000	370	100	19	19
2	36	52	132	1,710	355	86	18	18
3	36	52	178	1,320	340	86	18	18
4	36	52	285	1,100	325	86	17	18
5	38	55	490	940	310	79	17	18
6	41	57	1,320	900	295	72	16	17
7	42	68	1,710	940	280	64	16	17
8	46	89	980	940	270	57	15	17
9	48	89	740	940	260	52	15	17
10	49	88	700	860	255	49	14	17
11	51	86	700	740	245	46	14	16
12	53	94	700	660	235	43	13	16
13	55	89	700	640	226	40	12	16
14	57	84	780	625	215	37	12	18
15	55	80	860	590	215	34	11	16
16	54	78	940	538	215	30	10	14
17	52	76	1,020	625	240	27	10	12
18	49	72	1,020	590	260	26	9	10
19	47	72	1,060	555	280	26	8	9
20	47	100	1,100	566	260	25	8	9
21	46	157	1,390	578	240	25	7	8
22	46	157	1,590	590	230	24	6	8
23	46	157	1,840	624	220	24	6	7
24	47	157	1,590	583	210	23	8	6
25	47	157	1,340	624	200	22	10	6
26	46	157	1,240	583	191	22	12	6
27	46	157	1,140	499	174	21	14	6
28	45	157	1,060	442	156	20	16	6
29	45	157	1,060	413	142	20	18	6
30	45	157	1,710	385	128	19	19	6
31	45	....	2,200	....	114	....	19	6

NOTE.—Discharge determined from a rating curve well defined between 30 and 1,500 second-feet. Discharge, Nov. 21 to 30, 1910, Mar. 1 to 7, 30, 31, Apr. 1 to 4, and 23 to 29, estimated from records at the lower Crooked River station. Discharge interpolated for all other days when no gage height was reported.

Monthly discharge of Crooked River near Post, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	57	36	46.2	2,840	B.
November	....	48	102	6,070	B.
December	....	....	274	16,800	C.
January	....	....	146	8,980	C.
February	....	....	174	9,660	C.
March	2,200	94	1,020	62,700	C.
April	2,000	385	770	45,800	B.
May	370	114	240	14,800	B.
June	100	19	42.8	2,550	B.
July	19	6	13.1	806	C.
August	19	6	12.4	762	C.
The period	....	....	....	172,000	

NOTE.—Discharge for December, January, and February estimated as 92 per cent of discharge at lower Crooked River station.

CROOKED RIVER NEAR PRINEVILLE, OREG.

Location.—In sec. 36, T. 15 S., R. 15 E., about 5½ miles south of Prineville, near point from which diversion can be made to Agency Plains, north of lower Crooked River.

Records available.—October 31, 1908, to September 30, 1911.

Drainage area.—About 1,990 square miles.

Gage.—Vertical staff; datum unchanged.

Channel.—Sand; somewhat shifting.

Discharge measurements.—At ordinary and flood stages made from a flume structure; at low water by wading above a riffle about half a mile above the gage.

Winter flow.—Probably affected by ice during extremely cold weather.

Diversions.—A large and undetermined amount of diversion above station for irrigation.

Accuracy.—Results good for total run-off, but somewhat uncertain for some low-water periods.

Discharge measurements of Crooked River near Prineville, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*
Nov. 5	R. W. Davenport	0.94	51.6
Dec. 3	.....do	2.30	413
3	.....do	2.08	339

Daily gage height, in feet, of Crooked River near Prineville, Oreg., for the year ending Sept. 30, 1911.

[S. S. Stearns, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.83	0.90	2.20	1.55	2.00	1.00	5.6	......	1.10	0.60	0.32	0.20
2	.83	......	......	......	......	......	5.3	2.00	1.00	.60	......	......
3	.85	.90	2.35	1.40	1.70	1.40	4.8	......	1.00	.58	.30	.20
4	.85	......	3.10	......	1.50	1.60	4.1	2.10	.90	.55	.30	......
5	.85	.93	3.20	1.50	1.60	2.00	3.7	......	.90	.58	.28	.25
6	.87	......	2.80	......	......	2.6	3.3	1.95	.90	.50	.30	......
7	.87	.90	1.97	1.25	1.80	4.3	3.1	1.85	.90	.45	.30	.25
8	.85	1.10	1.85	1.30	......	5.0	3.0	......	.85	.45	.30	.28
9	.85	1.10	1.76	......	2.30	3.3	3.1	1.70	.80	.40	.30	.50
10	.85	1.10	1.97	......	......	3.0	3.2	1.70	......	.35	.30	.50
11	.85	1.10	......	1.60	1.36	2.8	2.9	1.70	.70	.35	.30	.48
12	.93	1.40	2.20	......	......	2.8	2.6	......	.65	.35	.30	.48
13	.93	1.20	2.60	1.30	1.50	2.8	2.45	1.70	.60	.35	.25	.47
14	1.00	1.20	......	......	......	3.1	2.30	......	.55	.35	.25	.47
15	......	1.20	2.10	......	1.40	3.3	2.30	1.55	.60	.35	.27	.46
16	1.00	......	......	......	......	3.7	......	......	.50	......	.27	.45
17	1.00	1.10	1.65	......	1.60	3.8	2.5	1.50	.50	.35	.25	.40
18	.93	......	......	......	......	4.0	2.5	2.6	.50	......	.25	.45
19	.95	1.10	1.50	1.35	1.30	4.0	2.6	......	.45	.38	.25	.45
20	.95	......	......	......	......	4.6	2.25	1.85	.40	......	.24	......
21	.95	1.15	......	2.00	1.70	4.9	2.25	......	.40	......	.22	.40
22	.95	......	1.30	......	......	5.1	2.5	1.60	.35	.35	.22	.40
23	.95	1.30	......	......	1.30	5.6	......	1.50	.32	......	.22	.45
24	.90	......	1.50	......	......	5.6	2.7	......	.37	.50	.22	.45
25	......	1.40	......	1.40	1.40	5.0	2.6	......	.40	.45	.20	......
26	.92	1.30	1.60	......	......	4.4	2.7	1.45	.33	......	.20	.52
27	......	1.30	1.30	......	1.20	4.0	2.6	1.40	.40	.30	.20	.50
28	.90	1.50	......	1.30	......	4.0	2.40	1.40	.50	......	.20	......
29	......	2.10	1.43	......	......	3.9	2.25	1.30	.60	.10	.20	.52
30	.90	2.20	......	1.30	......	4.8	......	1.20	.58	......	.20	.52
31	......	......	1.60	......	......	5.5	......	......	......	.20	......	......

NOTE.—River frozen over Jan. 13 to 19, and Jan. 25 to about Mar. 5. Gage heights not seriously affected.

Daily discharge, in second-feet, of Crooked River near Prineville, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	35	44	376	180	310	60	2,980	417	125	34	12	7
2	35	44	404	162	266	102	2,630	386	103	34	12	7
3	38	44	431	143	221	143	2,120	404	103	32	11	7
4	38	46	763	155	167	193	1,510	422	82	29	11	8
5	38	49	813	167	193	310	1,220	396	82	32	10	9
6	40	46	621	138	222	532	970	369	82	24	11	9
7	40	44	301	109	250	1,560	870	336	82	20	11	9
8	38	78	265	120	331	2,200	820	312	72	20	11	10
9	38	78	238	144	412	870	870	287	63	17	11	24
10	38	78	301	169	273	715	920	287	55	14	11	24
11	38	78	338	193	134	621	770	287	47	14	11	23
12	49	143	376	156	150	621	633	287	40	14	11	23
13	49	98	532	120	167	621	566	287	34	14	9	22
14	60	98	437	122	155	763	500	264	29	14	9	22
15	60	98	342	124	143	870	500	242	34	14	10	21
16	60	88	274	126	168	1,110	544	234	24	14	10	20
17	60	78	207	128	193	1,180	588	227	24	14	9	17
18	49	78	187	130	156	1,320	588	633	24	14	9	20
19	52	78	167	132	120	1,320	633	484	20	16	9	20
20	52	83	149	223	170	1,820	480	336	17	16	9	18
21	52	88	138	310	221	2,100	480	296	17	14	8	17
22	52	104	120	268	170	2,300	588	256	14	14	8	17
23	52	120	144	226	120	2,880	633	227	12	19	8	20
24	44	132	167	185	136	2,980	678	222	15	24	8	20
25	46	143	180	143	143	2,320	633	218	17	20	7	23
26	47	120	193	135	120	1,760	678	213	13	16	7	26
27	46	120	120	128	98	1,430	633	199	17	11	7	24
28	44	167	135	120	79	1,430	543	199	24	8	7	25
29	44	342	150	120	....	1,360	480	173	34	4	7	26
30	44	376	172	120	....	2,120	449	148	32	6	7	26
31	44	....	193	223	....	2,860	....	136	....	7	7	....

NOTE.—Discharge determined from two rating curves, both well defined between 5 and 1,500 second-feet. Discharge interpolated for days when no gage heights were reported.

Monthly discharge of Crooked River near Prineville, Oreg., for the year ending Sept. 30, 1911.

Month	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	60	35	45.9	2,820	A.
November	376	44	106	6,310	A.
December	813	120	298	18,300	A.
January	310	109	159	9,780	B.
February	412	79	189	10,500	A.
March	2,980	60	1,310	80,600	C.
April	2,980	449	884	52,600	B.
May	633	136	296	18,200	A.
June	125	12	44.6	2,650	A.
July	34	4	17.5	1,060	A.
August	12	7	9.8	572	A.
September	26	7	18.1	1,080	A.
The year	2,390	4	267	204,000	

OCHOCO CREEK NEAR HOWARD, OREG.

Location.—In sec. 34, T. 13 S., R. 19 E., just below the mouth of Canyon Creek, 7 miles above Howard and about 25 miles east of Prineville.

Records available.—October 28, 1910, to March 14, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on right bank.

Channel.—Gravel; fairly permanent.

Discharge measurements.—Made by wading.

Winter flow.—Not seriously affected by ice.

Diversions.—Station is above all diversions, except one small ditch.

Cooperation.—Gage readings furnished by United States Forest Service.

Estimates withheld for additional discharge measurements.

Discharge measurements of Ochoco Creek near Howard, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*
Oct. 28	R. W. Davenport	0.48	0.5
Dec. 1	....do	.70	4

Daily gage height, in feet, of Ochoco Creek near Howard, Oreg., for the year ending Sept. 30, 1911.

[C. C. Hon, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1			0.70	0.68	0.60	0.60	16			0.75		0.60	
2			.75	.65	.60	.60	17			.75		.60	
3			.90	.65	.60	.60	18			.75		.60	
4			.95	.65	.60	.60	19			.75		.60	
5			.88	.65	.62	.60	20			.75	0.62	.60	
6		0.48	.85	.65	62	62	21			.75	.62	.60	
7		50	.83	.65	.62	.65	22			.73	.62	.60	
8		.65	.82	.65	.62	.65	23			.70	.62	.60	
9		.60	.82	.65	.62	.66	24			.70	.60	.60	
10		.58	.82	.65		.68	25			.70	.60	.60	
11		.65	.82	.65		.70	26			.70	.60	.60	
12		.58	82	65		.72	27			.70	.60	.60	
13		.54	.80	.65		.73	28	0.48		.69	.60	.60	
14			.78	.65		.75	29	.48		.68	.60		
15			.75	.65	.60		30			.68	.60		
							31			.68	.60		

METOLIUS RIVER AT ALLINGHAM RANGER STATION. NEAR SISTERS, OREG.

Location.—In sec. 3, T. 13 S., R. 9 E., about 17 miles northwest of Sisters, at Allingham ranger station, 3 miles below head of river and 1½ miles below mouth of Lake Creek.

Records available.—September 16, 1910, to September 30, 1911.

Drainage area.—50 square miles.

Gage.—Vertical staff on left bank, 100 yards below ranger station.

Channel.—Rock and gravel; practically permanent.

Discharge measurements.—Made by wading a short distance below the gage.

Winter flow.—No effect of ice.

Diversions.—None.

Cooperation.—Station maintained in cooperation with the United States Forest Service.

Estimates withheld for additional discharge measurements.

Discharge measurements of Metolius River at Allingham ranger station, near Sisters, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Nov. 11	R. W. Davenport......	0.61	376	May 31	R. W. Davenport......	0.72	414

Daily gage height, in feet, of Metolius River at Allingham ranger station, near Sisters, Oreg., for the year ending Sept. 30, 1911.

[Perry South, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	May.	June.	July.	Aug.	Sept.
1	0.58	0.59	0.72	0.64	0.64	0.61	0.70	0.72	0.60	0.53	0.54
2	.58	.59	.74	64	.64	.62	.70	.72	.60	.53	.54
3	.60	.59	.77	.64	.64	....	.71	.72	.60	.53	.54
4	.60	.59	.90	.63	.63	....	.71	.73	.60	....	.54
5	.60	.58	.76	.63	....	.61	.72	.73	.60	....	.54
6	.59	.58	.74	.63	....	.61	.73	....	.59	.53	.54
7	.59	.60	.73	.63	....	.61	.74	....	.59	.53	.54
8	....	.63	.70	.62	.62	.62	.74	....	.59	.53	.54
9	....	.64	.77	.64	.62	.62	.74	.73	.59	.53	....
10	....	.63	....	.64	.63	.62	.74	.72	.59	.52	.54
11	....	.62	.73	.63	.62	.62	.74	.72	.59	.52	.54
12	....	.61	.73	.63	.64	.62	.75	.72	.58	.52	.54
13	....	.61	.72	.62	.62	.62	.74	.72	.58	.52	....
14	....	.60	.71	.63	.62	.62	.75	.71	....	.52	....
15	....	.60	.71	.62	.62	.62	.76	.71	....	.52	.53
16	....	.60	.70	.61	.62	.62	.77	.71	.58	.52	.53
17	....	.60	.69	.63	.61	....	.77	.70	.57	.52	.53
18	.59	.60	.69	.65	.61	....	.78	.68	.57	.53	.53
19	.59	.60	.69	.69	.61	.63	.78	....	.56	.53	.53
20	.58	.62	.68	.67	.61	.63	.78	....	.55	.53	.53
21	.59	.64	.68	.65	.61	.63	.78	.66	.55	.53	....
22	.59	.69	.67	.68	.61	.63	.77	.65	.54	.53	.53
23	.59	.67	....	.68	.61	.62	.76	.65	.54	.53	.53
24	.59	.67	.67	.65	.61	.62	....	.65	.54	.53	.53
25	.59	.66	.67	.65	.60	.63	....	.64	.54	.54	.53
26	.59	.66	.66	.64	.60	.63	.74	.64	.54	.54	.53
27	.59	.69	.65	.64	.60	.63	.74	.63	.53	.54	.53
28	.59	.75	.65	.63	.61	.63	.73	.63	.53	.54	.53
29	.59	.73	.65	.63	....	....	.73	.62	.53	.54	.53
30	.59	.71	.65	.63	....	.62	.72	.62	.53	.54	.53
31	.59	....	.64	.64	....	.62	.72	....	.53	.54	....

Note.—No records obtained for April.

METOLIUS RIVER AT HUBBARD'S RANCH, NEAR GRANDVIEW,[1] OREG.

Location.—In sec. 34, T. 10 S., R. 10 E., about 20 miles from Grandview, 35 miles from Sisters, and 16 miles above the mouth of the river; 9 miles above the station at Riggs ranch and 2 miles below Whitewater Creek, the lowest large tributary.

Records available.—April 24, 1910, to September 30, 1911.

Drainage area.—299 square miles.

Gage.—Vertical staff on right bank.

Channel.—Gravel and bowlders; possibly shifting. Two channels below gage.

Discharge measurements.—Made from a standard car and cable half a mile below the gage.

Winter flow.—No material effect of ice.

Diversions.—A few small private irrigation ditches take out above the station.

Storage.—None developed.

Cooperation.—Gage heights furnished by C. T. Hubbard.

Estimates withheld for additional data.

The following discharge measurement was made by R. W. Davenport:

May 28, 1911: Gage height, 0.25 foot; discharge, 1,600 second-feet.

Daily gage height, in feet, of Metolius River at Hubbard's ranch, near Grandview, Oreg., for the year ending Sept. 30, 1911.

[C. T. Hubbard, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.20	0.15	0.40	0.2	0.2	0.2	0.3	0.2	0.4	0.4	0.2	0.2
2	.20	.15	.42	.2	.2	.2	.3	.3	.4	.4	.2	.2
3	.52	.15	.51	.2	.2	.2	.3	.3	.4	.4	.2	.2
4	.40	.15	.48	.2	.2	.2	.3	.3	.4	.4	.2	.2
5	.35	.15	.41	.2	.2	.2	.3	.3	.4	.4	.2	.2
6	.20	.15	.38	.2	.2	.2	.3	.3	.4	.4	.2	.2
7	.20	.15	.38	.2	.2	.2	.3	.3	.4	.3	.2	.2
8	.19	......	.42	.2	.2	.2	.3	.3	.4	.3	.2	.2
9	.18	......	.40	.2	.2	.2	.3	.3	......	.3	.2	.2
10	.18	......	.37	.2	.2	.2	.3	.3	......	.3	.2	.2
11	.20	......	.35	.2	.2	.2	.3	.3	.4	.3	.2	.2
12	.18	.21	.34	.2	.2	.2	.3	.3	.5	.3	.2	.2
13	.17	.20	.33	.2	.2	.2	.3	.3	.5	.3	.2	.2
14	.15	.19	.30	.2	.2	.2	.2	.3	.4	.4	.2	.2
15	.15	.18	.30	.2	.2	.2	.2	.3	.4	.4	.2	.2
16	.18	.18	.30	.2	.2	.2	.2	.3	.4	.4	.2	.2
17	.25	.18	.30	.4	.2	.2	.2	.3	.4	.4	.2	.2
18	.20	.21	.29	.4	.2	.2	.2	.4	.4	.4	.2	.2
19	.18	.20	.28	.3	.2	.2	.2	.3	.4	.3	.2	.2
20	.18	.20	.27	.3	.2	.2	.2	.3	.4	.3	.2	.2
21	.18	......	.27	.3	.2	.3	.3	.3	.4	.3	.2	.2
22	.18	.35	.26	.3	.2	.3	.3	.3	.4	.3	.2	.2
23	.18	......	.26	.3	.2	.3	.3	.3	.4	.3	.2	.2
24	.18	.35	.28	.2	.2	.3	.3	.3	.3	.2	.2	.2
25	.17	......	.27	.2	.2	.3	.3	.3	.4	.2	.2	.2
26	.17	......	.27	.2	.2	.3	.3	.3	.4	.2	.2	.2
27	.16	.30	.26	.2	.2	.3	.3	.3	.4	.3	.2	.2
28	.16	.36	.26	.2	.2	.3	.3	.3	.4	.3	.2	.2
29	.16	.42	.26	.2	......	.3	.3	.3	.4	.3	.2	.2
30	.16	.38	.25	.2	......	.3	.2	.3	.4	.3	.2	.2
31	.16	......	.25	.2	......	.3	......	.3	......	.3	.2	......

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[1] Described in previous reports as "near Sisters."

METOLIUS RIVER AT RIGGS'S RANCH, NEAR SISTERS OREG.

Location.—In the NE. ¼ sec. 28, T. 11 S., R. 11 E., about 26 miles north of Sisters and 7 miles above the mouth of the river.

Records available.—October 22, 1908, to September 30, 1911.

Drainage area.—347 square miles.

Gage.—Vertical staff. .

Channel.—Gravel and bowlders. Practically permanent.

Discharge measurements.—Made from a standard car and cable 50 feet above the gage section.

Winter flow.—Probably never any effect of ice, as stream is fed almost entirely by springs.

Diversions.—A few small private irrigation ditches divert water from this river above the station. No storage developed.

Accuracy.—Excellent rating curve developed.

Discharge measurements of Metolius River at Riggs's ranch near Sisters, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Nov. 10	R. W. Davenport......	1.12	1,940	May 24	R. W. Davenport......	0.74	1,550

Daily gage height, in feet, of Metolius River at Riggs's ranch, near Sisters, Oreg., for the year ending Sept. 30, 1911.

[D. N. Riggs, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.55	0.55	0.75	0.6	0.6	0.5	0.7	0.7	0.8	0.8	0.7	0.6
2	.55	.55	.8	.6	.6	.5	.7	.7	.8	.8	.7	.6
3	1.0	.55	1.0	.6	.6	.5	.7	.7	.8	.8	.7	.6
4	.7	.55	.9	.6	.6	.5	.7	.7	.8	.8	.7	.6
5	.7	.55	.85	.6	.6	.5	.7	.7	.8	.8	.6	.6
6	.65	.55	.85	.6	.6	.5	.7	.7	.8	.8	.6	.6
7	.6	.62	.85	.6	.6	.5	.7	.7	.8	.8	.6	.6
8	.6	.6	.85	.6	.6	.5	.7	.7	.8	.8	.6	.6
9	.6	.8	.85	.6	.6	.5	.7	.7	.8	.8	.6	.7
10	.6	1.0	.85	.6	.6	.5	.7	.7	.8	.8	.6	.6
11	.6	.8	.8	.6	.6	.6	.7	.8	.9	.8	.6	.6
12	.7	.6	.8	.6	.6	.6	.6	.8	1.0	.8	.6	.6
13	.6	.6	.75	.6	.6	.6	.6	.8	1.0	.8	.6	.6
14	.6	.6	.75	.6	.6	.6	.6	.8	.9	.7	.6	.6
15	.6	.6	.75	.6	.6	.6	.6	.8	.9	.7	.6	.6
16	.6	.6	.75	.6	.6	.6	.6	.8	.9	.7	.6	.6
17	.6	.6	.75	.6	.6	.6	.6	.8	.8	.8	.6	.6
18	.6	.6	.7	.7	.6	.6	.6	.8	.8	.8	.6	.6
19	.6	.6	.65	.8	.6	.6	.7	.8	.8	.8	.6	.6
20	.6	.6	.65	.8	.6	.6	.7	.8	.8	.8	.6	.6
21	.6	.95	.65	.8	.6	.6	.7	.8	.8	.8	.6	.6
22	.55	1.1	.65	.7	.6	.6	.7	.8	.8	.8	.6	.6
23	.55	1.1	.65	.7	.6	.7	.7	.7	.8	.7	.6	.6
24	.55	.8	.65	.7	.6	.7	.7	.7	.8	.7	.6	.6
25	.55	.75	.65	.7	.6	.7	.7	.7	.8	.7	.6	.6
26	.55	.75	.65	.7	.6	.7	.7	.7	.8	.7	.6	.6
27	.55	.75	.65	.6	.6	.7	.7	.8	.8	.7	.6	.6
28	.55	.75	.65	.6	.5	.7	.7	.8	.8	.7	.6	.6
29	.55	.9	.65	.6	......	.7	.7	.8	.8	.7	.6	.6
30	.55	.8	.65	.6	......	.7	.7	.8	.8	.7	.6	.6
31	.55	......	.65	.6	......	.8	......	.8	......	.7	.6	......

Daily discharge, in second-feet, of Metolius River at Riggs's ranch, near Sisters, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1,450	1,450	1,610	1,490	1,490	1,410	1,570	1,570	1,650	1,650	1,570	1,490
2	1,450	1,450	1,650	1,490	1,490	1,410	1,570	1,570	1,650	1,650	1,570	1,490
3	1,830	1,450	1,830	1,490	1,490	1,410	1,570	1,570	1,650	1,650	1,570	1,490
4	1,570	1,450	1,740	1,490	1,490	1,410	1,570	1,570	1,650	1,650	1,570	1,490
5	1,570	1,450	1,700	1,490	1,490	1,410	1,570	1,570	1,650	1,650	1,490	1,490
6	1,530	1,450	1,700	1,490	1,490	1,410	1,570	1,570	1,650	1,650	1,490	1,490
7	1,490	1,490	1,700	1,490	1,490	1,410	1,570	1,570	1,650	1,650	1,490	1,490
8	1,490	1,490	1,700	1,490	1,490	1,410	1,570	1,570	1,650	1,650	1,490	1,490
9	1,490	1,650	1,700	1,490	1,490	1,410	1,570	1,570	1,650	1,650	1,490	1,570
10	1,490	1,830	1,700	1,490	1,490	1,410	1,570	1,570	1,650	1,650	1,490	1,490
11	1,490	1,650	1,650	1,490	1,490	1,490	1,570	1,650	1,740	1,650	1,490	1,490
12	1,570	1,490	1,650	1,490	1,490	1,490	1,490	1,650	1,830	1,650	1,490	1,490
13	1,490	1,490	1,610	1,490	1,490	1,490	1,490	1,650	1,830	1,650	1,490	1,490
14	1,490	1,490	1,610	1,490	1,490	1,490	1,490	1,650	1,740	1,570	1,490	1,490
15	1,490	1,490	1,610	1,490	1,490	1,490	1,490	1,650	1,740	1,570	1,490	1,490
16	1,490	1,490	1,610	1,490	1,490	1,490	1,490	1,650	1,740	1,570	1,490	1,490
17	1,490	1,490	1,610	1,490	1,490	1,490	1,490	1,650	1,650	1,650	1,490	1,490
18	1,490	1,490	1,570	1,570	1,490	1,490	1,490	1,650	1,650	1,650	1,490	1,490
19	1,490	1,490	1,530	1,650	1,490	1,490	1,570	1,650	1,650	1,650	1,490	1,490
20	1,490	1,490	1,530	1,650	1,490	1,490	1,570	1,650	1,650	1,650	1,490	1,490
21	1,490	1,780	1,530	1,650	1,490	1,490	1,570	1,650	1,650	1,650	1,490	1,490
22	1,450	1,920	1,530	1,570	1,490	1,490	1,570	1,650	1,650	1,650	1,490	1,490
23	1,450	1,920	1,530	1,570	1,490	1,570	1,570	1,570	1,650	1,570	1,490	1,490
24	1,450	1,650	1,530	1,570	1,490	1,570	1,570	1,570	1,650	1,570	1,490	1,490
25	1,450	1,610	1,530	1,570	1,490	1,570	1,570	1,570	1,650	1,570	1,490	1,490
26	1,450	1,610	1,530	1,570	1,490	1,570	1,570	1,570	1,650	1,570	1,490	1,490
27	1,450	1,610	1,530	1,490	1,490	1,570	1,570	1,650	1,650	1,570	1,490	1,490
28	1,450	1,610	1,530	1,490	1,410	1,570	1,570	1,650	1,650	1,570	1,490	1,490
29	1,450	1,740	1,530	1,490	....	1,570	1,570	1,650	1,650	1,570	1,490	1,490
30	1,450	1,650	1,530	1,490	....	1,570	1,570	1,630	1,650	1,570	1,490	1,490
31	1,450	....	1,530	1,490	....	1,630	....	1,630	....	1,570	1,490	....

NOTE.—Discharge determined from a well-defined rating curve.

Monthly discharge of Metolius River at Riggs's ranch, near Sisters, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	1,830	1,450	1,490	91,600	A.
November	1,920	1,450	1,580	94,000	A.
December	1,830	1,530	1,610	99,000	A.
January	1,650	1,490	1,520	93,500	A.
February	1,490	1,410	1,490	82,800	A.
March	1,650	1,410	1,490	91,600	A.
April	1,570	1,490	1,550	92,200	A.
May	1,650	1,570	1,610	99,000	A.
June	1,830	1,650	1,670	99,400	A.
July	1,650	1,570	1,620	99,600	A.
August	1,570	1,490	1,500	92,200	A.
September	1,570	1,490	1,490	88,700	A.
The year	1,920	1,410	1,550	1,120,000	

LAKE CREEK NEAR SISTERS, OREG.

Location.—In the SE. ¼ sec. 24, T. 13 S., R. 8 E., one-fourth mile below Suttle Lake, 6 miles from Allingham ranger station, 6 miles above the mouth, and 19 miles northwest of Sisters.

Records available.—May to November, 1911, occasional readings.

Drainage area.—20.5 square miles.

Gage.—Vertical staff spiked to alder on right bank.

Channel.—Gravel; practically permanent.

Discharge measurements.—Made by wading.

Cooperation.—Gage readings furnished by Perry A. South.

Estimates withheld for additional measurements.

The following discharge measurement was made by R. W. Davenport:

May 31, 1911: Gage height, 0.70 foot; discharge, 78.4 second-feet.

Gage height, in feet, of Lake Creek near Sisters, Oreg., for 1911.

May 31	0.70	July 27	0.28	Oct. 9	0.10
June 1	.75	Aug. 23	.24	Nov. 6	.40
July 18	.38	Sept. 13	.18		

WHITEWATER CREEK NEAR GRANDVIEW, OREG.

Location.—In sec. 28, T. 10 S., R. 10 E., one-fourth mile above the mouth of the creek, 15 miles northwest of Grandview, and 27 miles north of Sisters.

Records available.—May 28, 1911, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on right bank. Prior to September 18, 1911, vertical staff at about the same location and datum.

Channel.—Gravel and bowlders. Control formed by fallen tree.

Discharge measurements.—Made by wading.

Cooperation.—Maintained in cooperation with Office of Indian Affairs.

Estimates withheld for further data.

The following discharge measurement was made by R. W. Davenport:

May 28. 1911: Gage height, 1.09 feet; discharge, 98.4 second-feet.

Daily gage height, in feet, of Whitewater Creek near Grandview, Oreg., for the year ending Sept. 30, 1911.

[C. T. Hubbard, observer.]

Day.	June.	July.	Aug.	Sept.	Day.	June.	July.	Aug.	Sept.
1					16		1.40		
2	1.25	1.20			17	1.30			
3					18		1.40		0.85
4					19				
5					20				
6					21				
7			1.10		22				
8					23		1.25		
9		1.18			24				.72
10					25	1.20			
11					26				
12					27				
13	1.45		1.00		28				
14					29				
15					30		1.20		.80
					31				

SHITIKE CREEK AT WARMSPRING, OREG.

Location.—In the NE. ¼ sec. 26, T. 9 S., R. 12 E., at Warmspring, about 2 miles above the mouth of the creek and below all tributaries.

Records available.—June 11 to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on left bank opposite store.

Channel.—Gravel and sand; likely to shift somewhat.

Discharge measurements.—Made by wading or from footbridge.

Winter flow.—Apparently unaffected by ice.

Diversions.—Probably no diversion above the station.

Accuracy.—Results for 1911 good, except for high water and for certain periods not covered by measurements, during which channel may have shifted.

Cooperation.—Station maintained in cooperation with the Office of Indian Affairs.

Discharge measurements of Shitike Creek at Warmspring, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
June 7	R. W. Davenport	1.52	15.7
July 28	Charles Leidl	1.15	57.6
Sept. 29	R. W. Davenport	1.08	56.4

Daily gage height, in feet, and discharge, in second-feet, of Shitike Creek at Warmspring, Oreg., for the year ending Sept. 30, 1911.

Day.	June.		July.		Aug.		Sept.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1			1.35	108	1.2	75	1.05	50
2			1.25	86	1.2	75	1.05	50
3			1.4	120	1.2	75	1.05	50
4			1.45	134	1.2	75	1.1	57
5			1.4	120	1.2	75	1.15	66
6			1.4	120	1.2	75	1.15	66
7			1.4	120	1.2	75	1.15	66
8			1.3	96	1.15	66	1.1	57
9			1.35	108	1.15	66	1.15	66
10			1.35	108	1.1	57	1.15	66
11	1.5	147	1.3	96	1.1	57	1.1	57
12	1.7	213	1.3	96	1.1	57	1.1	57
13	1.8	248	1.3	96	1.1	57	1.1	57
14	1.6	178	1.3	96	1.1	57	1.25	86
15	1.8	248	1.3	96	1.1	57	1.25	86
16	1.5	147	1.3	96	1.1	57	1.25	86
17	1.5	147	1.3	96	1.1	57	1.1	57
18	1.6	178	1.3	96	1.1	57	1.1	57
19	1.5	147	1.3	96	1.1	57	1.1	57
20	1.4	120	1.25	86	1.1	57	1.1	57
21	1.4	120	1.25	86	1.1	57	1.1	57
22	1.45	134	1.2	75	1.1	57	1.1	57
23	1.4	120	1.2	75	1.1	57	1.1	57
24	1.4	120	1.2	75	1.05	50	1.1	57
25	1.35	108	1.2	75	1.05	50	1.1	57
26	1.35	108	1.2	75	1.05	50	1.2	75
27	1.5	147	1.2	75	1.05	50	1.2	75
28	1.5	147	1.15	66	1.05	50	1.1	57
29	1.4	120	1.15	66	1.05	50	1.1	57
30	1.4	120	1.2	75	1.05	50	1.1	57
31			1.2	75	1.05	50		

NOTE.—Discharge determined from a rating curve fairly well defined between 50 and 250 second-feet.

Monthly discharge of Shitike Creek at Warmspring, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
June 11-30	248	120	151	5,970	B.
July	134	66	93.2	5,730	B.
August	75	50	59.8	3,680	B.
September	86	50	61.9	3,680	B.
The period				19,100	

WARM SPRINGS RIVER NEAR WARMSPRING, OREG.

Location.—In the NE. ¼ sec. 19, T. 8 S., R. 13 E., at bridge on road between Warmspring and Simnasho, 9 miles from the former and 15 miles from the latter.

Records available.—July 29 to September 30, 1911; fragmentary.

Drainage area.—Not measured.

Gage.—Vertical staff spiked to pier of old bridge.

Channel.—Gravel; practically permanent.

Discharge measurements.—Made from stringer of old bridge or by wading.

Winter flow.—River probably never freezes.

Diversions.—None.

Cooperation.—Station maintained in cooperation with the Office of Indian Affairs.

Estimates withheld for additional data.

Discharge measurements of Warm Springs River near Warmspring, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
July 29	Charles Leidl	1.00	256
Sept. 29	R. W. Davenport	1.00	260

Daily gage height, in feet, of Warm Springs River near Warmspring, Oreg., for the year ending Sept. 30, 1911.

Day.	July.	Aug.	Sept.	Day.	July.	Aug.	Sept.	Day.	July.	Aug.	Sept.
1				11				21			
2				12				22			
3			1.0	13		1.1		23			
4				14				24			1.0
5				15				25			
6		1.0		16				26			
7				17			1.1	27		1.0	
8				18				28			
9				19				29	1.0		1.0
10			1.0	20		1.0		30			
								31	1.0		

WHITE RIVER NEAR TYGH VALLEY, OREG.

Location.—In sec. 10, T. 4 S., R. 13 E., 1 mile south of Tygh Valley, 1 mile above mouth of Tygh Creek, and 4 miles above the White River Falls development of Pacific Power & Light Co.

Records available.—June 18 to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on lower corner of left pier of highway bridge.

Channel.—Gravel and sand; shifting. White River carries a heavy load of glacial sediment at times.

Discharge measurements.—Made from lower side of highway bridge.

Winter flow.—Affected by ice; ice jams occasionally form during extremely cold weather.

Diversions.—Probably no diversion from White River above the station, although diversion of water for irrigation lands south of lower White River is probably feasible.

Accuracy.—Results good during low water, but somewhat uncertain at other times, as not enough measurements have been made to determine possible shifts.

Discharge measurements of White River near Tygh Valley, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
June 9	R. W. Davenport	1.10	449
July 28	Charles Leidl	.33	136
Sept. 28	R. W. Davenport	.30	131

Daily gage height, in feet, and discharge, in second-feet, of White River near Tygh Valley Oreg., for the year ending Sept. 30, 1911.

[J. J. Powell, observer.]

Day.	June.		July.		August.		September.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1			0.69	259	0.29	124	0.20	102
2			.65	244	.32	133	.20	102
3			.62	233	.34	139	.20	102
4			.61	229	.30	127	.25	114
5			.60	225	.29	124	.52	196
6			.60	225	.29	124	.40	156
7			.55	207	.25	114	.35	142
8			.59	220	.20	102	.30	127
9			.54	203	.25	114	.50	189
10			.50	189	.25	114	.65	244
11			.48	182	.25	114	.45	172
12			.45	172	.25	114	.35	142
13			.45	172	.25	114	.35	142
14			.45	172	.25	114	.32	133
15			.44	169	.22	107	.35	142
16			.44	169	.20	102	.45	172
17			.42	163	.20	102	.45	172
18	0.96	378	.48	182	.20	102	.40	156
19	.93	363	.40	156	.20	102	.38	150
20	.81	308	.40	156	.22	107	.35	142
21	.70	263	.35	142	.23	110	.35	142
22	.85	326	.34	139	.22	107	.32	133
23	.82	312	.40	156	.20	102	.30	127
24	.79	299	.48	182	.20	102	.30	127
25	.70	263	.45	172	.20	102	.30	127
26	.70	263	.40	156	.25	114	.30	127
27	.80	303	.35	142	.25	114	.30	127
28	.75	283	.35	142	.24	112	.35	142
29	.79	299	.30	127	.22	107	.30	127
30	.70	263	.35	142	.20	102	.30	127
31			.32	133	.20	102		

NOTE.—Discharge determined from a well-defined rating curve.

Monthly discharge of White River near Tygh Valley, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
June 18-30	378	263	302	7,780	A.
July	259	127	179	11,000	A.
August	139	102	112	6,890	A.
September	244	102	143	8,510	A.
The period				34,200	

TYGH CREEK AT TYGH VALLEY, OREG.

Location.—In sec. 3, T. 4 S., R. 13 E., about one-fourth mile north of the Tygh Valley post office, 100 feet below the wagon bridge. It is about 1 mile above mouth of river.

Records available.—June 9 to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Gravel and sand; shifts somewhat.

Discharge measurements.—Made from the highway bridge at Tygh Valley, or by wading.

Winter flow.—Materially affected by ice; no records obtained during the winter.

Accuracy.—Results good during low water; uncertain at higher stages on account of possible shifts.

Discharge measurements of Tygh Creek at Tygh Valley, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
June 9	R. W. Davenport	1.68	115
July 27	Charles Leidl	.88	15.1
Sept. 28	R. W. Davenport	.95	25.8

Daily gage height, in feet, and discharge, in second-feet, of Tygh Creek at Tygh Valley, Oreg., for the year ending Sept. 30, 1911.

[R. G. Weisbeck, observer.]

Day.	June.		July.		August.		September.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1			1.38	63	0.90	16	0.80	11
2			1.35	60	.85	14	.80	11
3			1.30	53	.90	16	.80	11
4			1.30	53	.90	16	.80	11
5			1.30	53	.85	14	1.22	44
6			1.25	48	.85	14	1.15	37
7			1.20	42	.85	14	1.10	32
8			1.20	42	.85	14	1.00	23
9			1.15	37	.85	14	1.45	74
10			1.15	37	.90	16	1.35	68
11	1.62	102	1.10	32	.85	14	1.15	44
12	1.75	130	1.10	32	.90	16	1.10	39
13	1.70	118	1.05	28	.85	14	1.05	34
14	1.70	118	1.05	28	.85	14	1.05	34
15	1.75	130	1.05	28	.85	14	1.00	30
16	1.65	108	1.00	23	.85	14	1.05	34
17	1.65	108	.95	20	.90	16	1.10	39
18	1.60	98	.95	20	.90	16	1.10	39
19	1.60	98	.95	20	.90	16	1.05	34
20	1.55	90	.95	20	.90	16	1.05	34
21	1.50	81	.95	20	.90	16	1.00	30
22	1.50	81	.95	20	.90	16	.95	26
23	1.50	81	.95	20	.90	16	.98	28
24	1.50	81	.95	20	.90	16	.95	26
25	1.45	74	.90	16	.90	16	.90	22
26	1.42	69	.90	16	.90	16	.90	22
27	1.43	70	.90	16	.90	16	.90	22
28	1.45	74	.90	16	.85	14	.90	22
29	1.42	69	.90	16	.85	14	.95	26
30	1.40	66	.90	16	.85	14	.95	26
31			.85	14	.80	11		

NOTE.—Discharge June 11 to Sept. 9 determined from a rating curve well defined between 12 and 150 second-feet. Discharge Sept. 10 to 30 determined from a fairly well-defined rating curve.

Monthly discharge of Tygh Creek at Tygh Valley, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
June 11-30	130	66	92.3	3,660	A.
July	63	14	30.0	1,840	A.
August	16	11	14.9	916	A.
September	74	11	31.1	1,850	A.
The period				8,270	

KLICKITAT RIVER NEAR GLENWOOD, WASH.

Location.—In sec. 14, T. 7 N., R. 12 E., just below Dairy Creek, 2½ miles below the southern boundary of the Yakima Indian Reservation, 3 miles below Big Muddy Creek, and about 6 miles north of Glenwood.

Records available.—December 16, 1910, to September 30, 1911, at present location; October 9, 1909, to December 15, 1910, at a point 1 mile above, in sec. 11.

Drainage area.—356 square miles at present location; 350 square miles at first location.

Gage.—Lietz automatic gage referred to vertical staff. Several vertical staffs used prior to July 19, 1910.

Channel.—Gravel and sand; shifting.

Discharge measurements.—Made at a cable bridge just below gage.

Accuracy.—Results good.

Cooperation.—Maintained by W. R. King, chief engineer Klickitat Valley Development Co.

Discharge measurements of Klickitat River near Glenwood, Wash., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 18	W. R. King	0.78	571	Mar. 14	W. R. King	0.57	413
Nov. 11	do	1.75	1,620	15	do	.52	441
				16	do	.67	477
1911.				23	do	1.34	981
Jan. 12	W. R. King	.67	519	May 1	do	1.82	1,400
28	do	.62	452	31	do	2.22	2,050
Feb. 15	do	.50	395	June 13	do	2.58	2,650
16	do	.47	345	July 20	do	1.03	757
Mar. 1	do	.41	331	29	C. J. Bartholet	.96	692
2	do	.40	360	Aug. 21	do	.70	486
13	do	.43	387				

Daily gage height, in feet, of Klickitat River near Glenwood, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.60	0.58	0.84	0.68	0.64	0.54	1.58	1.83	2.59	1.42	0.96	0.80
2	.78	.58	.92	.70	.61	.52	1.58	1.89	2.62	1.45	.94	.80
3	1.28	.57	1.04	.72	.60	.54	1.50	1.94	2.44	1.48	.96	.73
4	1.06	.56	.99	.73	.61	.54	1.41	2.08	2.25	1.47	.95	.67
5	.89	.56	.94	.71	.63	.54	1.33	2.05	2.12	1.50	.94	.79
6	.82	.57	.92	.72	.62	.54	1.28	1.97	2.12	1.50	.92	.72
7	.81	.82	.90	.74	.60	.56	1.26	1.88	2.13	1.41	.89	.71
8	.84	.80	.89	.74	.60	.58	1.28	1.94	2.06	1.32	.87	.68
9	.82	.92	.86	.76	.59	.57	1.38	1.84	2.08	1.26	.88	1.00
10	.76	1.47	.81	.72	.62	.56	1.37	1.76	2.22	1.25	.90	.88
11	.70	1.62	.81	.72	.61	.56	1.30	1.75	2.38	1.25	.90	.74
12	.70	1.28	.76	.71	.60	.54	1.23	1.80	2.52	1.24	.88	.70
13	.66	1.08	.73	......	.60	.58	1.16	1.76	2.55	1.26	.86	.68
14	.64	.94	.71	.58	.60	.61	1.14	1.70	2.44	1.30	.82	.70
15	.63	.85	.72	......	.57	.66	1.16	1.75	2.30	1.32	.80	.75
16	.63	.80	.75	......	.56	.71	1.16	1.86	2.17	1.36	.82	.78
17	.79	.76	.74	......	.56	.78	1.18	2.04	2.06	1.28	.83	.74
18	.74	.74	.73	......	.58	.85	1.10	2.08	1.96	1.16	.86	.70
19	.68	.69	.72	.72	.56	.90	.98	1.94	1.86	1.12	.82	.66
20	.66	1.04	.72	.70	.54	1.00	.97	1.86	1.78	1.08	.76	.64
21	.65	1.60	.76	.68	.56	1.10	......	1.98	1.74	1.06	.74	.64
22	.62	1.41	.71	.64	.55	1.19	1.48	2.00	1.74	1.04	.76	.64
23	.58	1.20	.85	.62	.52	1.32	1.62	1.96	1.67	1.04	.76	.66
24	.62	1.04	.88	.68	.54	1.32	1.81	1.90	1.59	1.06	.80	.66
25	.68	.93	.80	.68	.55	1.26	1.96	1.87	1.54	1.06	.79	.65
26	.62	.93	.81	.65	.53	1.18	1.93	1.82	1.63	1.04	.78	.66
27	.59	.96	.78	.64	.50	1.15	1.89	1.82	1.68	1.01	.78	.64
28	.58	.92	.76	.63	.52	1.10	1.84	1.82	1.58	1.02	.77	.62
29	.59	.89	.75	.58	......	1.18	1.81	1.89	1.50	1.03	.78	.60
30	.59	.86	.75	.63	......	1.30	1.80	2.05	1.44	1.01	.80	.59
31	.58	......	.74	.66	......	1.46	......	2.32	......	.98	.81	......

Daily discharge, in second-feet, of Klickitat River near Glenwood, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June.	July.	Aug.	Sept.
1	493	474	654	497	471	409	1,212	1,497	2,704	1,052	681	570
2	641	474	753	510	450	397	1,218	1,573	2,753	1,084	671	570
3	1,054	470	805	523	444	405	1,132	1,640	2,458	1,121	681	526
4	828	466	772	527	451	410	1,045	1,833	2,096	1,103	678	488
5	695	457	733	513	462	404	976	1,789	1,898	1,127	674	567
6	648	470	713	517	456	407	934	1,729	1,891	1,076	653	523
7	638	643	700	537	447	420	917	1,559	1,905	996	633	514
8	663	635	695	536	444	429	936	1,640	1,810	961	620	497
9	641	722	669	547	438	416	1,014	1,504	1,825	916	626	722
10	595	1,292	638	517	453	423	1,010	1,404	2,041	908	642	630
11	570	1,445	638	516	450	422	945	1,398	2,368	909	642	533
12	562	1,049	604	514	440	412	894	1,453	2,641	905	629	507
13	541	845	585	472	444	429	842	1,410	2,697	914	610	494
14	518	730	570	429	441	451	821	1,347	2,450	945	589	504
15	515	665	577	438	427	481	826	1,401	2,176	1,015	573	540
16	516	626	597	456	418	514	841	1,541	1,969	994	587	563
17	627	604	532	474	423	560	854	1,773	1,796	940	593	530
18	593	589	528	492	435	607	789	1,833	1,665	833	614	507
19	558	558	519	520	423	645	696	1,646	1,528	807	583	484
20	540	855	520	510	408	719	646	1,528	1,436	779	549	461
21	529	1,415	545	497	419	795	878	1,689	1,405	764	533	461
22	504	1,192	513	469	414	861	1,109	1,712	1,386	742	546	468
23	482	961	608	453	396	969	1,251	1,665	1,308	750	547	478
24	511	809	623	488	408	970	1,476	1,593	1,223	760	570	478
25	550	723	573	491	413	922	1,665	1,546	1,172	760	567	474
26	512	723	580	475	401	850	1,626	1,491	1,267	742	560	481
27	487	742	557	471	389	829	1,573	1,485	1,324	723	556	465
28	482	713	547	462	399	795	1,510	1,484	1,218	730	553	453
29	487	694	539	431	....	857	1,471	1,573	1,127	737	560	444
30	487	673	540	463	....	956	1,465	1,701	1,070	723	574	438
31	478	....	530	478	....	1,096	....	2,264	....	700	580	....

NOTE.—Discharge determined from two well-defined rating curves. Discharge interpolated Jan. 13 and 15 to 18, 1911.

Monthly discharge of Klickitat River near Glenwood, Wash., for the year ending Sept. 30, 1911.

[Drainage area, 356 square miles.[a]]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	1,050	478	579	1.65	1.90	35,600	A.
November	1,440	457	757	2.16	2.41	45,000	A.
December	830	519	612	1.75	2.02	37,600	B.
January	547	429	491	1.38	1.59	30,200	B.
February	471	389	431	1.21	1.26	23,900	A.
March	1,096	397	621	1.74	2.01	38,200	A.
April	1,665	646	1,090	3.06	3.41	64,900	A.
May	2,264	1,347	1,610	4.52	5.21	99,000	A.
June	2,753	1,070	1,820	5.11	5.70	108,000	A.
July	1,127	700	888	2.49	2.87	54,600	A.
August	685	533	603	1.69	1.95	37,100	A.
September	722	438	512	1.44	1.61	30,500	A.
The year	2,753	389	835	2.35	31.94	605,000	

[a] 350 square miles used for October to December.

KLICKITAT RIVER AT KLICKITAT, WASH.

Location.—In sec. 23, T. 4 N., R. 13 E., just back of Klickitat post office, just below Snider Creek, and 14 miles above the mouth.

Records available.—July 3, 1909, to September 30, 1911.

Drainage area.—1,090 square miles.

Gage.—Vertical staff.

Channel.—Gravel and bowlders; practically permanent.

Discharge measurements.—Made from Spokane, Portland & Seattle Railroad bridge three-fourths of a mile above gage.

Accuracy.—Results good.

Discharge measurements of Klickitat River at Klickitat, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 24	F. C. Ebert	1.96	993	July 24	Charles Leidl	2.18	1,160
Dec. 19	John Dubuis	2.21	1,230	Sept. 16	do	1.93	979
1911.							
Apr. 4	Charles Leidl	3.42	2,660				

Daily gage height, in feet, of Klickitat River at Klickitat, Wash., for the year ending Sept. 30, 1911.

[Mrs. M. A. Young, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.8	1.85	2.3	2.1	2.6	1.75	3.7	3.2	3.8	2.5	2.0	1.85
2	1.8	1.8	2.45	2.1	2.45	1.8	3.6	3.2	4.0	2.5	2.0	1.9
3	2.4	1.8	3.15	2.1	2.35	1.8	3.6	3.5	3.8	2.5	1.95	1.85
4	2.5	1.8	2.95	2.1	2.25	1.9	3.4	3.4	3.6	2.5	2.0	1.8
5	2.3	1.8	2.8	2.1	2.2	1.9	3.3	3.4	3.4	2.6	1.95	2.0
6	2.0	1.8	2.7	2.1	2.2	1.9	3.2	3.3	3.4	2.5	1.9	1.9
7	2.05	1.95	2.75	2.1	2.15	2.0	3.2	3.2	3.4	2.5	1.9	1.9
8	2.05	2.1	2.85	2.05	2.1	2.1	3.1	3.3	3.4	2.4	1.9	1.8
9	2.05	2.1	2.8	2.05	2.0	2.3	3.1	3.2	3.3	2.3	1.9	2.2
10	2.0	2.3	2.6	2.05	2.1	2.3	3.1	3.1	3.3	2.3	1.9	2.1
11	2.0	2.7	2.55	2.0	2.1	2.4	3.0	3.0	3.6	2.3	1.9	1.9
12	1.95	2.95	2.45	2.0	2.1	2.4	2.9	3.1	3.8	2.3	1.9	1.85
13	1.9	2.5	2.4	2.0	2.0	2.4	2.8	3.0	3.8	2.3	1.85	1.8
14	1.9	2.2	2.4	2.0	2.0	2.5	2.8	3.0	3.7	2.3	1.9	1.8
15	1.9	2.1	2.35	1.95	1.9	2.7	2.8	3.0	3.6	2.3	1.85	1.85
16	1.9	2.1	2.3	1.95	1.85	2.8	2.8	3.0	3.4	2.4	1.85	1.85
17	1.95	2.0	2.3	2.05	1.9	3.0	2.8	3.2	3.2	2.3	1.85	1.8
18	1.95	2.0	2.25	2.5	1.95	3.1	2.8	3.5	3.1	2.25	1.9	1.8
19	1.95	2.05	2.2	3.0	1.95	3.2	2.8	3.4	3.0	2.25	1.9	1.8
20	2.0	2.1	2.2	2.6	1.9	3.4	2.8	3.2	3.0	2.2	1.85	1.8
21	1.95	3.15	2.15	2.4	1.9	3.5	2.8	3.2	2.9	2.2	1.8	1.8
22	1.95	3.1	2.1	2.3	1.9	3.6	3.0	3.3	3.0	2.1	1.8	1.8
23	1.95	3.0	2.1	2.2	1.85	3.8	3.0	3.2	2.8	2.1	1.8	1.8
24	1.95	2.7	2.5	2.3	1.9	3.8	3.1	3.3	2.7	2.1	1.8	1.75
25	1.95	2.45	2.4	2.3	1.85	3.7	3.4	3.3	2.6	2.1	1.8	1.75
26	1.95	2.35	2.35	2.2	1.8	3.5	3.4	3.2	2.7	2.1	1.8	1.8
27	1.95	2.3	2.3	2.2	1.8	3.4	3.3	3.2	2.9	2.0	1.8	1.75
28	1.9	2.3	2.3	2.1	1.75	3.3	3.3	3.2	2.8	2.0	1.8	1.75
29	1.85	2.3	2.25	2.1	....	3.4	3.2	3.2	2.7	2.1	1.85	1.75
30	1.85	2.3	2.2	2.1	....	3.4	3.2	3.2	2.6	2.05	1.9	1.7
31	1.85	....	2.15	2.4	....	3.6	....	3.6	....	2.0	1.9	....

Daily discharge, in second-feet, of Klickitat River at Klickitat, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	835	882	1,350	1,110	1,620	810	3,130	2,390	3,290	1,510	1,020	892
2	835	835	1,520	1,110	1,460	850	2,970	2,390	3,610	1,510	1,020	935
3	1,460	835	2,400	1,110	1,350	850	2,970	2,820	3,290	1,510	978	892
4	1,580	835	2,140	1,110	1,250	935	2,670	2,670	2,970	1,510	1,020	850
5	1,350	835	1,950	1,110	1,200	935	2,530	2,670	2,670	1,620	978	1,020
6	1,030	835	1,820	1,110	1,200	935	2,390	2,530	2,670	1,510	935	935
7	1,080	980	1,880	1,110	1,160	1,020	2,390	2,390	2,670	1,510	935	935
8	1,080	1,130	2,020	1,060	1,110	1,110	2,250	2,530	2,670	1,400	935	850
9	1,080	1,130	1,950	1,060	1,020	1,300	2,250	2,390	2,530	1,300	935	1,200
10	1,030	1,350	1,700	1,060	1,110	1,300	2,250	2,250	2,530	1,300	935	1,110
11	1,030	1,820	1,640	1,020	1,110	1,400	2,210	2,120	2,970	1,300	935	935
12	980	2,140	1,520	1,020	1,110	1,400	1,990	2,250	3,290	1,300	935	892
13	930	1,580	1,460	1,020	1,020	1,400	1,860	2,120	3,290	1,300	892	850
14	930	1,240	1,460	1,020	1,020	1,510	1,860	2,120	3,130	1,300	935	850
15	930	1,130	1,400	978	935	1,740	1,860	2,120	2,970	1,300	892	892
16	930	1,130	1,350	978	892	1,860	1,860	2,120	2,670	1,400	892	892
17	980	1,030	1,350	1,060	935	2,120	1,860	2,390	2,390	1,300	892	850
18	980	1,030	1,300	1,510	978	2,250	1,860	2,820	2,250	1,250	935	850
19	980	1,080	1,240	2,120	978	2,390	1,860	2,670	2,120	1,250	935	850
20	1,030	1,130	1,240	1,620	935	2,670	1,860	2,390	2,120	1,200	892	850
21	980	2,400	1,180	1,400	935	2,820	1,860	2,390	1,990	1,200	850	850
22	980	2,340	1,130	1,300	935	2,970	2,120	2,530	2,120	1,110	850	850
23	980	2,210	1,130	1,200	892	3,290	2,120	2,390	1,860	1,110	850	850
24	980	1,820	1,580	1,300	935	3,290	2,250	2,530	1,740	1,110	850	810
25	980	1,520	1,460	1,300	892	3,130	2,670	2,530	1,620	1,110	850	810
26	980	1,400	1,400	1,200	850	2,820	2,670	2,390	1,740	1,110	850	850
27	980	1,350	1,350	1,200	850	2,670	2,530	2,390	1,990	1,020	850	810
28	930	1,350	1,350	1,110	810	2,530	2,530	2,390	1,860	1,020	850	810
29	882	1,350	1,300	1,110	....	2,670	2,390	2,390	1,740	1,110	892	810
30	882	1,350	1,240	1,110	....	2,670	2,390	2,390	1,620	1,060	935	770
31	882	....	1,180	1,400	....	2,970	....	2,970	....	1,020	935	......

NOTE.—Discharge determined from a well-defined rating curve.

Monthly discharge of Klickitat River at Klickitat, Wash., for the year ending Sept. 30, 1911.

[Drainage area, 1,090 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	1,580	835	1,020	0.936	1.08	62,700	A.
November	2,400	835	1,330	1.22	1.36	79,100	A.
December	2,400	1,130	1,520	1.39	1.60	93,500	A.
January	2,120	978	1,190	1.10	1.27	73,200	A.
February	1,620	810	1,050	.964	1.00	58,300	A.
March	3,290	810	1,960	1.80	2.08	121,000	A.
April	3,130	1,860	2,280	2.10	2.34	136,000	A.
May	2,970	2,120	2,430	2.23	2.57	149,000	A.
June	3,610	1,620	2,480	2.28	2.54	148,000	A.
July	1,620	1,020	1,280	1.17	1.35	78,700	A.
August	1,020	850	916	.840	.97	56,300	A.
September	1,200	770	885	.812	.91	52,700	A.
The year	3,610	770	1,530	1.40	19.07	1,110,000	

LITTLE KLICKITAT RIVER NEAR GOLDENDALE, WASH.

Location.—In sec. 10, T. 4 N., R. 16 E., at a highway bridge at Hanging Rock ranch, 2½ miles above Goldendale.

Records available.—June 25, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Rocks and gravel; somewhat shifting.

Discharge measurements.—Made by wading or from the highway bridge at the gage.

Accuracy.—Results good, except June to August, 1911, when gage-height record was fragmentary.

Discharge measurements of Little Klickitat River near Goldendale, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1910.		*Feet.*	*Sec.-ft.*
Dec. 17	John Dubuis	1.40	48.6	Feb. 26	Charles Leidl	1.19	21.7
				Mar. 11	.....do	1.66	83.4
1911.				18	.....do	2.10	190
Feb. 18	Charles Leidl	1.25	29.0	July 22	.....do	.80	1.5

Daily gage height, in feet, of Little Klickitat River near Goldendale, Wash., for the year ending Sept. 30, 1911.

[F. T. Miller, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Sept.
1			1.38	1.48	1.60		2.00	1.48	1.45		
2			1.42	1.48	1.45	1.30	1.95	1.45	1.50		
3	1.30		1.96	1.45	1.49	1.30	1.90	1.48	1.48		
4	1.30		1.85		1.45	1.32	1.80	1.50	1.42		
5	1.05		1.26		1.38	1.25	1.75	1.50	1.40		
6	1.10		1.21	1.32	1.38			1.48	1.38		0.95
7			1.25	1.35	1,36	1.56	1.65	1.45	1.35		.98
8		1.05	1.58	1.32	1.32		1.62	1.55	1.30		.94
9		1.12	1.79	1.35	1.31	1.72	1.62	1.45	1.30		.96
10	1.00	1.30	1.70	1.32	1.32	1.70	1.60	1.42	1.32		.98
11		1.28	1.75	1.35	1.32	1.70	1.58	1.42	1.30		.91
12		1.18	1.68	1.32	1.35	1.78	1.55	1.42			
13		1.12	1.65	1.40	1.35		1.50	1.40			.90
14		1.11	1.50	1.38	1.30		1.52	1.38			
15			1.45		1.35	1.92	1.45	1.35			.90
16			1.45		1.35	2.00	1.50				
17			1.45		1.35	2.05	1.42		1.32		
18			1.35	1.95	1.35	2.10					
19			1.32	1.93	1.25	2.20	1.42				
20			1.32	1.60	1.26	2.20	1.45	1.45			
21				1.55	1.35	2.20	1.45				
22			1.30	1.50	1.20	2.20	1.48			.80	.85
23		1.55	1.72	1.68	1.32		1.48				
24		1.32	1.62	1.50	1.20	2.20	1.50				
25		1.44	1.52	1.40	1.20	2.10	1.55				
26		1.40	1.55	1.40	1.20	2.00	1.55				
27		1.40	1.52	1.35		1.95	1.48	1.45			
28		1.36	1.50	1.35		1.88	1.50	1.45			
29		1.35	1.48	1.30		1.90	1.48	1.42			
30		1.36	1.48	1.34		1.92	1.50		1.15		.88
31				1.62		2.00		1.45			

Daily discharge, in second-feet, of Little Klickitat River near Goldendale, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June.	July.	Sept.
1	....	12	46	58	78	30	164	58	54	18	2.4
2	....	12	46	58	54	33	152	54	61	17	3.3
3	33	12	152	54	60	33	140	58	58	16	4.2
4	33	12	129	48	54	36	118	61	49	15	5.1
5	12	12	28	42	43	28	108	61	46	14	6.0
6	15	12	23	36	43	50	98	58	43	13	6.9
7	14	12	28	40	41	71	88	54	40	12	8.2
8	12	12	78	36	36	86	82	70	33	11	6.5
9	10	15	118	40	34	101	82	54	33	10	7.3
10	9	33	97	36	36	97	78	49	36	9.4	8.2
11	9	28	108	40	36	97	75	49	33	8.7	5.2
12	9	23	97	36	40	114	70	49	33	8.0	5.0
13	9	15	88	46	40	124	61	46	34	7.4	4.8
14	9	15	61	43	33	134	64	43	34	6.7	4.8
15	9	21	54	70	40	145	54	40	35	6.0	4.8
16	9	27	54	97	40	164	61	43	35	5.4	4.6
17	9	33	46	125	40	177	49	46	36	4.8	4.4
18	10	40	40	152	40	190	49	48	35	4.1	4.1
19	10	46	33	159	28	216	49	51	34	3.4	3.8
20	10	52	33	78	29	216	54	54	32	2.8	3.6
21	10	58	33	70	40	216	54	54	31	2.2	3.4
22	10	64	33	61	23	216	58	54	30	1.5	3.2
23	10	70	97	93	36	216	58	54	28	1.5	3.3
24	10	33	78	61	23	216	61	54	27	1.5	3.4
25	11	54	61	46	23	190	70	54	26	1.5	3.5
26	11	46	70	46	23	164	70	54	24	1.5	3.6
27	11	46	61	40	26	152	58	54	23	1.5	3.7
28	11	40	61	40	28	136	61	54	22	1.5	3.8
29	11	40	61	33	....	140	58	49	20	1.5	3.9
30	11	40	61	38	....	145	61	52	19	1.5	4.1
31	11	....	60	82	....	164	....	54	....	1.5	....

NOTE.—Discharge determined from a well-defined rating curve. Discharge July 23 to Aug. 31 estimated. Discharge interpolated for all other days when no gage height was reported.

Monthly discharge of Little Klickitat River near Goldendale, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	33	9	12.0	690	C.
November	70	12	31.2	1,860	B.
December	152	23	65.6	4,030	A.
January	159	33	61.4	3,780	A.
February	78	23	38.1	2,120	A.
March	216	28	132	8,120	A.
April	164	49	76.8	4,570	A.
May	70	40	52.7	3,240	B.
June	61	19	34.8	2,070	C.
July	18	1.5	6.77	416	D.
August	....	....	1.5	92.2	D.
September	8.2	2.4	4.64	276	B.
The period	....	....	....	31,300	

HOOD RIVER AT WINANS, OREG.

Location.—In sec. 1, T. 1 N., R. 9 E., 300 feet below the junction of the East and West forks, half a mile from Winans, 4½ miles above Tucker's bridge, and 10½ miles above Hood River.

Records available.—November 7, 1905, to March 16, 1907; January 16, 1910, to September 30, 1911.

Drainage area.—252 square miles (revised value based on recent measurement).

Gage.—Staff in two sections on right bank; lower section inclined, upper vertical. Datum of gage prior to January 16, 1910, 0.50 foot lower than present.

Channel.—Coarse gravel; not likely to shift.

Discharge measurements.—Made from cable near gage.

Accuracy.—Results good.

No discharge measurements made during the year.

Daily gage height, in feet, of Hood River at Winans, Oreg., for the year ending Sept. 30, 1911.

[W. R. Winans, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.1	0.3	2.0	0.8	0.8	0.1	1.6	1.2	1.5	0.6	0.2	0.0
2	.9	.3	1.8	.8	.8	.0	1.5	1.4	1.4	.7	.2	.0
3	1.0	.4	1.7	.8	1.0	.0	1.4	1.7	1.4	.8	.2	.0
4	1.0	.4	1.6	.8	.9	−.1	1.4	1.5	1.3	.8	.2	.0
5	.7	.4	1.6	.8	.8	.0	1.3	1.4	1.0	.8	.2	.4
6	.5	1.0	1.8	.8	.7	.0	1.2	1.3	.9	.8	.2	.3
7	.4	1.6	1.6	.8	.6	+.1	1.2	1.3	.9	.8	.2	.1
8	.3	2.0	1.8	.8	.5	.2	1.1	1.3	.9	.8	.2	.1
9	.3	3.0	2.0	.8	.5	.3	1.0	1.3	.9	.7	.2	1.1
10	.2	3.6	2.0	.7	.5	.4	1.0	1.2	.9	.6	.1	1.1
11	.2	3.0	1.8	.7	.6	.4	.9	1.2	1.0	.6	.1	1.1
12	.2	2.6	1.6	.6	.6	.5	.8	1.2	1.2	.5	.1	1.1
13	.2	2.4	1.4	.6	.5	.5	.7	1.2	1.4	.6	.1	1.2
14	.2	2.4	1.2	.5	.4	.5	.6	1.2	1.5	.7	.1	1.5
15	.2	2.4	1.1	.5	.4	.6	.6	1.2	1.3	.8	.1	1.8
16	.1	2.3	1.0	.5	.3	.7	.7	1.2	1.2	.8	.1	1.4
17	.1	2.2	.8	.5	.3	.8	.7	1.3	1.2	.8	.1	1.3
18	.1	2.0	.9	1.0	.3	.9	.7	2.2	1.0	.6	.1	.5
19	.1	2.0	1.0	1.9	.3	1.0	.8	2.5	1.0	.5	.1	.2
20	.1	1.9	1.0	1.5	.3	1.0	.8	2.0	.9	.3	.1	.1
21	.1	1.6	.9	1.5	.3	1.1	.9	1.5	.9	.3	.0	.1
22	.1	1.5	.9	1.4	.2	1.2	.9	1.5	.9	.3	.0	.1
23	.2	1.4	.8	1.0	.2	1.3	.9	1.4	.9	.3	.0	.1
24	.2	1.2	.8	.9	.2	1.4	.9	1.3	.8	.3	.0	.1
25	.2	1.2	.8	.8	.2	1.5	.9	1.3	.8	.3	.0	.2
26	.2	1.2	.8	.7	.2	1.5	1.0	1.2	.7	.3	.0	.1
27	.2	1.3	.9	.6	.2	1.5	1.2	1.1	.7	.2	.0	.1
28	.2	1.3	.9	.6	.1	1.6	1.1	.9	.6	.2	.0	.0
29	.2	1.4	.8	.6	....	1.6	1.0	.9	.6	.2	.0	.0
30	.2	1.8	.8	.7	....	1.6	1.0	1.0	.6	.2	.0	.0
31	.3	....	.8	.7	....	1.6	....	1.2	....	.2	.0	....

Daily discharge, in second-feet, of Hood River at Winans, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	510	635	2,050	965	965	510	1,570	1,260	1,490	825	570	450
2	1,080	635	1,860	965	965	450	1,490	1,410	1,410	895	570	450
3	1,160	700	1,770	965	1,110	450	1,410	1,650	1,410	965	570	450
4	1,160	700	1,680	965	1,040	395	1,410	1,490	1,340	965	570	450
5	920	700	1,680	965	965	450	1,340	1,110	1,110	965	570	695
6	770	1,160	1,860	965	895	450	1,260	1,340	1,040	965	570	630
7	700	1,680	1,680	965	825	510	1,260	1,340	1,040	965	570	510
8	635	2,050	1,860	965	760	570	1,180	1,340	1,040	965	570	510
9	635	3,050	2,050	965	760	630	1,110	1,340	1,040	895	570	1,180
10	570	3,670	2,050	895	760	695	1,110	1,260	1,040	825	510	1,180
11	570	3,050	1,860	895	825	695	1,040	1,260	1,110	825	510	1,180
12	570	2,650	1,680	825	825	760	965	1,260	1,260	760	510	1,180
13	570	2,450	1,500	825	760	760	895	1,260	1,410	825	510	1,260
14	570	2,450	1,320	760	695	760	825	1,260	1,490	895	510	1,490
15	570	2,450	1,240	760	695	825	825	1,260	1,340	965	510	1,730
16	510	2,350	1,160	760	630	895	895	1,260	1,260	965	510	1,410
17	510	2,250	1,000	760	630	965	895	1,340	1,260	965	510	1,340
18	510	2,050	1,080	1,110	630	1,040	895	2,070	1,110	825	510	760
19	510	2,050	1,160	1,820	630	1,110	965	2,320	1,110	760	510	570
20	510	1,950	1,160	1,490	630	1,110	965	1,900	1,040	630	510	510
21	510	1,680	1,080	1,490	630	1,180	1,040	1,490	1,040	630	450	510
22	510	1,590	1,080	1,410	570	1,260	1,040	1,490	1,040	630	450	510
23	570	1,500	1,000	1,110	570	1,340	1,040	1,410	1,040	630	450	510
24	570	1,320	1,000	1,040	570	1,410	1,040	1,340	965	630	450	510
25	570	1,320	1,000	965	570	1,490	1,040	1,340	965	630	450	570
26	570	1,320	1,000	895	570	1,490	1,110	1,260	895	630	450	510
27	570	1,410	1,080	825	570	1,490	1,260	1,180	895	570	450	510
28	570	1,410	1,080	825	510	1,570	1,180	1,040	825	570	450	450
29	570	1,500	1,000	825	....	1,570	1,110	1,040	825	570	450	450
30	570	1,860	1,000	895	....	1,570	1,110	1,110	825	570	450	450
31	635	....	1,000	895	....	1,570	....	1,260	....	570	450	....

NOTE.—Discharge determined from a rating curve well defined between 450 and 1,200 second-feet.

Monthly discharge of Hood River at Winans, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy
	Maximum.	Minimum.	Mean.		
October	1,160	510	637	39,200	B.
November	3,670	635	1,790	107,000	B.
December	2,050	1,000	1,390	85,500	B.
January	1,820	760	992	61,000	A.
February	1,110	510	734	40,800	A.
March	1,570	395	967	59,500	A.
April	1,570	825	1,110	66,000	A.
May	2,320	1,040	1,390	85,500	A.
June	1,490	825	1,120	66,600	A.
July	965	570	783	48,100	A.
August	570	450	506	31,100	A.
September	1,730	450	764	45,500	A.
The year	2,320	395	1,020	736,000	

WHITE SALMON RIVER AT HUSUM, WASH.

Location.—In the SE. ¼ sec. 25, T. 4 N., R. 10 E., 1,000 feet above falls and power house at Husum, and three-eighths of a mile above Rattlesnake Creek.

Records available.—September 23, 1909, to September 30, 1911.

Drainage area.—300 square miles.

Gage.—Vertical staff.

Channel.—Gravel and lava bowlders; practically permanent. Control is crest of falls and is sometimes obstructed by logs, causing backwater.

Discharge measurements.—Made from cable 100 feet below gage.

Regulation.—Flow affected at times by operation of splash dam 10 miles upstream.

Diversions.—A few ditches divert for irrigation in Trout Lake valley.

Accuracy.—Only fair on account of effect of backwater.

Discharge measurements of White Salmon River at Husum, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 2	E. S. Fullor	4.80	1,210	July 25	Charles Leidl	3.50	714
3	Charles Leidl	4.36	1,070	Sept. 13	.....do	3.14	643
17	.....do	4.10	1,270				

Daily gage height, in feet, of White Salmon River at Husum, Wash., for the year ending Sept. 30, 1911.

[H. M. Thompson and John Wassell, observers.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jnue.	July.	Aug.	Sept.
1	3.0	2.95	3.65	3.6	3.7	3.4	4.2	4.6	4.7	4.0	3.4	3.2
2	3.05	2.9	3.75	3.6	3.7	3.4	4.4	4.6	4.6	3.9	3.4	3.2
3	3.7	3.0	4.4	3.5	3.6	3.4	4.4	4.6	4.8	3.9	3.4	3.1
4	3.6	2.95	4.3	3.5	3.6	3.4	4.4	4.8	4.6	3.8	3.4	3.2
5	3.5	2.95	4.35	3.6	3.6	3.4	4.3	5.6	4.6	3.8	3.4	3.2
6	3.2	2.95	4.2	3.6	3.6	3.4	4.2	5.8	4.5	3.8	3.4	3.2
7	3.15	3.3	4.1	3.6	3.6	3.4	4.2	5.3	4.4	3.8	3.4	3.1
8	3.1	3.5	4.2	3.6	3.5	3.4	4.1	4.8	4.4	3.8	3.3	3.1
9	3.1	3.45	4.1	3.7	3.5	3.5	4.2	4.4	4.4	3.7	3.3	3.3
10	3.05	4.6	4.1	3.7	3.5	3.4	4.3	4.2	4.5	3.6	3.3	3.4
11	3.05	5.0	4.05	3.6	3.6	3.4	4.4	4.1	4.6	3.6	3.3	3.1
12	3.05	4.2	4.0	3.6	3.6	3.5	4.3	4.1	4.5	3.6	3.3	3.1
13	3.05	3.9	3.9	3.6	3.6	3.5	4.2	4.0	4.6	3.6	3.3	3.1
14	3.0	3.9	3.85	3.6	3.6	3.6	4.1	4.1	4.6	3.6	3.3	3.1
15	3.0	3.8	3.8	3.6	3.6	3.5	4.1	4.2	4.6	3.6	3.3	3.2
16	3.0	3.5	3.75	3.6	3.6	3.5	4.1	4.1	4.5	3.6	3.3	3.4
17	3.0	3.4	3.7	3.6	3.5	3.4	4.0	4.2	4.5	3.5	3.3	3.4
18	3.0	3.35	3.7	3.6	3.5	3.4	4.0	4.4	4.4	3.5	3.3	3.2
19	3.05	3.4	3.65	3.8	3.5	3.5	4.0	4.5	4.3	3.5	3.3	3.1
20	3.05	4.2	3.6	3.7	3.5	3.6	4.0	4.3	4.4	3.5	3.3	3.1
21	3.0	5.45	3.55	3.6	3.5	3.7	4.0	4.4	4.3	3.6	3.2	3.1
22	3.0	5.95	3.6	3.6	3.5	3.8	4.0	4.3	4.2	3.5	3.2	3.4
23	3.0	4.95	3.7	3.6	3.5	3.7	4.1	4.4	4.3	3.5	3.2	3.0
24	2.95	4.5	3.75	3.6	3.5	3.7	4.2	4.3	4.2	3.4	3.1	3.0
25	3.0	4.2	3.8	3.6	3.4	3.7	4.4	4.2	4.2	3.5	3.1	3.0
26	3.0	3.85	3.75	3.6	3.4	3.8	4.7	4.2	4.1	3.5	3.1	3.0
27	3.0	3.85	3.7	3.6	3.4	3.8	4.8	4.2	4.0	3.5	3.2	3.0
28	2.95	3.8	3.65	3.6	3.4	3.8	4.8	4.2	4.0	3.5	3.2	3.0
29	2.95	3.6	3.65	3.5	....	3.9	4.7	4.3	4.0	3.5	3.2	3.1
10	2.95	3.55	3.7	3.6	....	3.9	4.6	4.4	4.0	3.5	3.2	3.0
31	2.95	....	3.6	3.6	....	4.0	....	4.6	....	3.4	3.2	....

NOTE.—Gage heights Apr. 23 to May 10, and June 13 to Aug. 23, 1911, affected by backwater from logs lodged on the crest of the falls.

Daily discharge, in second-feet, of White Salmon River at Husum, Wash., for Sept. 24, 1909, to Sept, 30 1910.

Day.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	496	620	2,610	948	1,340	2,300	1,460	1,910	1,420	1,050	755	620
2	......	562	1,230	1,940	883	1,230	3,120	1,460	1,820	1,380	1,050	755	620
3	......	562	2,660	1,690	850	1,200	3,410	1,500	1,820	1,380	1,050	755	620
4	......	610	2,930	1,570	883	1,120	3,030	1,500	1,820	1,340	1,050	725	620
5	......	610	1,300	1,410	883	1,080	2,840	1,460	1,820	1,340	1,050	725	620
6	......	518	1,010	1,320	883	1,080	2,400	1,420	1.820	1.310	1,020	725	620
7	......	518	830	1,220	915	1,050	2,120	1,420	1,820	1,270	1,020	725	620
8	......	562	841	1,160	883	1,020	1,950	1,540	1,820	1,270	980	698	620
9	......	540	950	1,080	883	980	1,780	1,540	1,820	1,230	980	698	620
10	......	585	889	1,060	850	915	1,700	1,580	1,870	1,270	980	725	620
11	......	600	800	1,050	850	915	1,660	1,620	1,950	1,270	980	698	620
12	......	562	714	1,200	818	883	1,660	1,780	2,000	1,270	1,020	698	620
13	......	518	666	1,530	818	980	1,780	1,870	2,000	1,230	980	698	620
14	......	518	661	1,410	818	1,020	1,870	1,780	1,950	1,230	948	698	620
15	......	540	650	1,220	818	948	1,910	1,740	1,910	1,230	948	670	595
16	......	576	635	1,160	785	915	1,950	1,740	1,820	1,200	948	670	595
17	......	562	630	1,150	785	883	2,080	1,740	1,780	1,200	915	670	595
18	......	562	1,110	1,120	850	883	2,120	1,780	1,740	1,200	915	670	595
19	......	562	3,070	1,100	883	850	2,300	1,780	1,740	1,200	883	670	595
20	......	585	3.490	1,090	850	850	2,480	1,820	1,660	1,200	850	645	595
21	......	610	1,800	1,080	850	850	2,580	2,000	1,660	1,200	850	645	620
22	......	562	2,090	1,010	948	818	2,440	1,910	1,580	1,160	850	645	620
23	......	585	3,990	1,010	1,500	818	2,300	1,950	1,580	1,120	818	670	620
24	610	600	4,340	1,010	1,380	818	2,120	1,950	1,580	1,120	818	645	620
25	610	590	2,660	994	1,230	980	1,950	1,950	1,580	1,120	818	645	595
26	590	562	2,030	974	1,620	1,020	1,820	2,080	1,540	1,120	785	645	595
27	562	526	1,690	960	1,460	1,310	1,700	2,080	1,540	1,080	785	670	595
28	610	544	1,650	941	1,380	1,620	1,580	2,080	1,540	1,080	785	670	570
29	585	620	2,070	908	1,270	......	1,540	2,000	1,500	1,080	755	645	570
30	687	610	3,990	974	1,230	......	1,500	1,950	1.500	1,080	755	645	570
31	......	650	......	974	1,460	......	1,500	......	1,460	......	785	645	......

NOTE.—Discharge determined from a rating curve well defined below 3,500 second-feet.

Daily discharge, in second-feet, of White Salmon River at Husum, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	570	545	948	915	980	785	1,340	1,160	1,740	1,030	655	670
2	595	520	1,020	915	980	785	1,500	1,160	1,660	960	655	670
3	980	570	1,500	850	915	785	1,500	1,160	1,820	960	655	620
4	915	545	1,420	850	915	785	1,500	1,320	1.660	895	655	670
5	850	545	1,460	915	915	785	1,420	1,960	1,660	895	655	670
6	670	545	1,340	915	915	785	1,340	2,140	1,580	895	655	670
7	645	725	1,270	915	915	785	1,340	1,710	1,500	895	655	620
8	620	850	1,340	915	850	785	1,270	1,470	1,500	895	665	620
9	620	818	1,270	980	850	850	1,340	1,280	1,500	830	665	725
10	595	1,660	1,270	980	850	785	1,420	1,220	1,580	770	665	785
11	595	2,000	1,230	915	915	785	1,500	1,270	1,660	770	665	620
12	595	1,340	1,200	915	915	850	1,420	1,270	1,580	770	665	620
13	595	1,120	1,120	915	915	850	1,340	1,200	1,570	770	665	620
14	570	1,120	1,080	915	915	915	1,270	1,270	1,570	770	665	620
15	570	1,050	1,050	915	915	850	1,270	1,340	1,570	770	665	670
16	570	850	1,020	915	915	850	1,270	1,270	1,490	770	665	785
17	570	785	980	915	850	785	1,200	1,340	1,490	710	665	785
18	570	755	980	915	850	785	1,200	1,500	1,410	710	665	670
19	595	785	948	1,050	850	850	1,200	1,580	1,340	710	665	620
20	595	1,340	915	980	850	915	1,200	1,420	1,410	710	665	620
21	570	2,400	883	915	850	980	1,200	1,500	1,340	770	615	620
22	570	2,840	915	915	850	1,050	1,200	1,420	1,260	710	615	785
23	570	1,950	980	915	850	980	1,160	1,500	1,340	710	615	570
24	545	1,580	1,020	915	850	980	1,140	1,420	1,260	655	620	570
25	570	1,340	1,050	915	785	980	1,180	1,340	1,260	710	620	570
26	570	1,080	1,020	915	785	1,050	1,240	1,340	1,180	710	620	570
27	570	1,080	980	915	785	1,050	1,320	1,340	1,110	710	670	570
28	545	1,050	948	915	785	1,050	1,320	1,340	1,110	710	670	570
29	545	915	948	850	......	1,120	1,240	1,420	1,110	710	670	620
30	545	882	980	915	......	1,120	1,160	1,500	1,110	710	670	570
31	545	......	915	915	......	1,200	......	1,660	......	655	670	......

NOTE.—Discharge Oct. 1, 1910, to Apr. 22, 1911, May 11 to June 12, 1911, and Aug. 24 to Sept. 30, 1911, determined from a rating curve well defined below 3,500 second-feet. Discharge during the periods when gage heights were affected by backwater, determined from three poorly defined rating curves.

Monthly discharge of White Salmon River at Husum, Wash., for 1909-1911.

[Drainage area, 300 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
1909-10.							
October	650	496	568	1.89	2.18	34,900	B.
November	4,340	620	1,730	5.77	6.44	103,000	B.
December	2,610	908	1,220	4.07	4.69	75,000	B.
January	1,620	785	1,010	3.37	3.88	62,100	A.
February	1,620	818	1,010	3.37	3.51	56,100	A.
March	3,410	1,500	2,110	7.03	8.10	130,000	A.
April	2,080	1,420	1,750	5.83	6.50	104,000	A.
May	2,000	1,460	1,740	5.80	6.69	107,000	A.
June	1,420	1,080	1,220	4.07	4.54	72,600	A.
July	1,050	755	917	3.06	3.53	56,400	A.
August	755	645	685	2.28	2.63	42,100	A.
September	620	570	608	2.03	2.26	36,200	A.
The year	4,340	496	1,220	4.07	54.95	879,000	
1910-11.							
October	980	545	614	2.05	2.36	37,800	A.
November	2,840	520	1,120	3.73	4.16	66,600	A.
December	1,500	883	1,100	3.67	4.23	67,600	A.
January	1,050	850	919	3.06	3.53	56,500	A.
February	980	785	876	2.92	3.04	48,700	A.
March	1,200	785	900	3.00	3.46	55,300	A.
April	1,500	1,140	1,300	4.33	4.83	77,400	B.
May	2,140	1,160	1,410	4.70	5.42	86,700	B.
June	1,820	1,110	1,450	4.83	5.39	86,300	B.
July	1,030	655	782	2.61	3.01	48,100	B.
August	670	615	654	2.18	2.51	40,200	B.
September	785	570	646	2.15	2.40	38,400	A.
The year	2,840	520	980	3.27	44.34	710,000	

TROUT CREEK AT GULER, WASH.

Location.—In the SE. ¼ sec. 15, T. 6 N., R. 10 E., 500 feet below the highway bridge at Guler.

Records available.—September 16, 1909, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Staff in two sections on left bank; lower section inclined, upper vertical.

Channel.—Large moss-covered bowlders and fine sand; control shifting.

Discharge measurements.—Made from highway bridge or by wading near gage.

Winter flow.—Not seriously affected by ice.

Estimates withheld for additional data.

Discharge measurements of Trout Creek at Guler, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 3	Charles Leidl	4.60	642	July 26	Charles Leidl	1.50	65.3
18	.....do	4.42	667	Sept. 14	.....do	1.45	52.4

Daily gage height, in feet, of Trout Creek at Guler, Wash., for the year ending Sept. 30, 1911.

[Christian Guler, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.34	1.50	3.84	2.8	2.2	2.28	3.1	3.8	4.7	2.45	1.5	1.3
2	1.36	1.72	3.84	2.6	2.2	2.3	3.1	3.8	4.6	2.4	1.5	1.3
3	1.40	1.81	3.84	2.4	2.2	2.35	3.2	3.9	4.2	2.4	1.55	1.3
4	1.80	1.90	3.83	2.3	2.2	2.5	3.2	4.1	4.0	2.4	1.55	1.35
5	1.82	2.20	3.83	2.0	2.2	2.5	3.2	4.6	3.8	2.35	1.5	1.35
6	1.80	2.42	3.80	2.0	2.2	2.5	3.3	4.9	3.5	2.3	1.5	1.4
7	1.74	2.80	3.80	2.0	2.2	2.55	3.4	4.9	3.5	2.3	1.45	1.5
8	1.74	3.22	3.76	2.0	2.2	2.6	3.4	4.9	3.5	2.3	1.45	1.6
9	1.74	3.44	3.76	2.1	2.2	2.65	3.4	4.9	3.7	2.25	1.45	1.95
10	1.73	3.77	3.74	2.4	2.2	2.7	3.4	4.8	3.8	2.25	1.4	1.75
11	1.70	3.72	3.73	2.4	2.25	2.7	3.4	4.8	3.8	2.25	1.4	1.7
12	1.70	3.60	3.73	2.5	2.25	2.7	3.5	4.8	3.8	2.2	1.4	1.7
13	1.70	3.56	3.73	2.5	2.25	2.8	3.5	4.8	3.8	2.2	1.4	1.6
14	1.70	3.35	3.70	2.3	2.2	2.8	3.5	4.7	3.8	2.2	1.4	1.5
15	1.70	3.00	3.70	2.3	2.2	2.8	3.5	4.4	3.8	2.0	1.4	1.5
16	1.70	3.00	3.70	2.0	2.2	2.8	3.6	4.4	3.8	2.0	1.4	1.7
17	1.68	3.05	3.70	2.0	2.2	2.8	3.6	4.4	3.8	2.0	1.35	1.8
18	1.65	3.54	3.70	2.0	2.2	2.8	3.6	4.6	3.6	2.0	1.35	1.75
19	1.60	4.26	3.72	2.0	2.2	3.0	3.6	4.7	3.4	1.9	1.35	1.7
20	1.56	4.91	3.72	2.0	2.2	3.1	3.6	4.6	3.3	1.8	1.35	1.7
21	1.58	6.02	3.72	2.2	2.25	3.2	3.6	4.6	3.0	1.7	1.35	1.7
22	1.51	5.43	3.72	2.25	2.25	3.2	3.6	4.6	2.7	1.6	1.3	1.7
23	1.50	5.15	3.80	2.2	2.25	3.0	3.6	4.5	2.5	1.6	1.3	1.7
24	1.50	4.92	3.88	2.2	2.25	3.0	3.6	4.5	2.5	1.55	1.3	1.7
25	1.50	4.35	3.90	2.25	2.25	3.0	3.6	4.6	2.5	1.5	1.3	1.7
26	1.50	4.00	3.87	2.25	2.25	3.0	3.7	4.6	2.45	1.5	1.3	1.7
27	1.50	3.96	3.62	2.25	2.25	3.1	3.7	4.6	2.4	1.5	1.3	1.65
28	1.51	3.94	3.60	2.25	2.3	3.1	3.7	4.6	2.4	1.5	1.35	1.65
29	1.51	3.89	3.70	2.25	....	3.1	3.7	4.7	2.4	1.5	1.35	1.7
30	1.50	3.85	3.50	2.25	....	3.0	3.8	4.7	2.45	1.48	1.3	1.7
31	1.50	....	3.63	2.2	....	3.0	....	4.8	....	1.48	1.3	....

SANDY RIVER ABOVE SALMON RIVER, AT BRIGHTWOOD, OREG.

Location.—In sec. 24, T. 2 S., R. 6 E., at McIntyre's bridge, just back of the post office at Brightwood and three-fourths of a mile above Salmon River.

Records available.—May 17, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Rocks, sand, and gravel; somewhat shifting.

Discharge measurements.—Made from the bridge.

Accuracy.—Rating curve well defined. Gage record good; results excellent.

Cooperation.—Originally established by the Mount Hood Railway & Power Co., which furnishes gage heights.

Discharge measurements of Sandy River above Salmon River, at Brightwood, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
June 26	W. O. Harmon	1.65	412
July 17	....do	1.71	368

Daily gage height, in feet, of Sandy River above Salmon River, at Brightwood, Oreg., for the year ending Sept. 30, 1911.

[Glenn McIntyre, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.60	1.42	2.58	2.0	2.2	1.4	2.8	2.3	2.7	1.8	1.3	1.1
2	1.58	1.45	2.92	1.9	2.1	1.4	2.6	2.5	2.6	1.7	1.3	1.1
3	2.68	1.60	3.10	1.8	2.0	1.4	2.4	2.6	2.4	1.7	1.3	1.2
4	2.22	1.52	3.08	1.8	1.9	1.6	2.2	2.8	2.3	1.8	1.2	1.1
5	2.25	1.48	2.88	1.8	1.9	1.6	2.1	2.7	2.4	1.8	1.2	1.7
6	2.00	1.65	2.71	1.9	1.8	1.6	2.0	2.5	2.4	1.8	1.2	1.6
7	1.90	2.62	2.70	2.5	1.8	1.9	1.9	2.4	2.2	1.7	1.2	1.2
8	1.75	2.80	2.82	2.3	1.7	2.0	2.0	2.5	2.1	1.6	1.2	1.1
9	1.75	3.25	2.80	2.4	1.7	2.0	2.0	2.4	2.1	1.5	1.1	1.6
10	1.72	3.40	2.62	2.2	1.6	2.0	2.1	2.4	2.2	1.5	1.2	1.2
11	1.70	3.18	2.48	2.1	1.6	2.0	2.0	2.3	2.4	1.6	1.2	1.2
12	1.68	2.80	2.36	2.0	1.6	1.9	1.9	2.4	2.3	1.7	1.1	1.1
13	1.58	2.55	2.22	1.9	1.6	1.8	1.8	2.5	2.3	1.7	1.1	1.1
14	1.50	2.35	2.12	1.8	1.6	1.9	1.8	2.4	2.2	1.7	1.1	1.0
15	1.50	2.20	2.02	1.8	1.6	2.1	1.9	2.4	2.0	1.8	1.1	1.4
16	1.50	2.08	1.96	1.7	1.5	2.3	2.0	2.5	2.0	1.8	1.1	1.7
17	2.05	1.98	1.91	1.8	1.5	2.3	1.9	2.5	1.9	1.6	1.2	1.7
18	2.00	2.00	1.86	3.0	1.8	2.3	2.1	2.8	1.9	1.6	1.1	1.5
19	1.78	2.05	1.79	3.0	1.7	2.3	2.0	3.2	1.9	1.5	1.1	1.4
20	1.72	3.22	1.75	2.6	1.6	2.4	2.0	2.9	1.8	1.4	1.2	1.3
21	1.66	3.90	1.75	2.3	1.6	2.5	2.2	2.8	1.9	1.4	1.1	1.2
22	1.60	3.55	1.75	2.2	1.5	2.6	2.2	2.8	1.8	1.4	1.1	1.2
23	1.60	3.88	2.25	2.0	1.5	2.8	2.3	2.6	1.8	1.3	1.0	1.1
24	1.72	3.30	2.72	2.0	1.5	2.6	2.5	2.5	1.7	1.4	1.0	1.1
25	1.72	2.86	2.65	1.9	1.5	2.5	2.7	2.4	1.6	1.4	1.0	1.1
26	1.62	2.55	2.28	1.8	1.4	2.3	2.5	2.3	1.9	1.4	1.0	1.2
27	1.52	2.42	2.20	1.8	1.3	2.2	2.4	2.2	2.2	1.3	1.0	1.1
28	1.50	2.40	2.18	1.7	1.4	2.1	2.2	2.3	2.0	1.3	1.0	1.1
29	1.46	2.58	2.10	1.6	....	2.1	2.1	2.4	1.9	1.3	1.0	1.1
30	1.45	2.72	2.14	2.1	....	2.4	2.2	2.5	1.8	1.3	1.2	1.0
31	1.41	....	2.05	2.2	....	2.6	....	2.6	....	1.3	1.1	....

Daily discharge, in second-feet, of Sandy River above Salmon River, at Brightwood, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	321	277	979	562	689	318	1,170	761	1,080	462	291	248
2	316	284	1,280	509	622	318	995	915	995	420	291	248
3	908	321	1,460	462	562	318	837	995	837	420	291	268
4	572	300	1,440	462	509	382	689	1,170	761	462	268	248
5	590	290	1,250	462	509	382	622	1,080	837	462	268	420
6	456	335	1,090	509	462	382	562	915	837	462	268	382
7	414	857	1,080	915	462	509	509	837	689	420	268	268
8	364	1,020	1,190	761	420	562	562	915	622	382	268	248
9	364	1,470	1,170	837	420	562	562	837	622	348	248	382
10	355	1,640	1,010	689	382	562	622	837	689	348	268	268
11	349	1,390	899	622	382	562	562	761	837	382	268	268
12	343	1,020	807	562	382	509	509	837	761	420	248	248
13	316	800	703	509	382	462	462	915	761	420	248	248
14	295	652	635	462	382	509	462	837	689	420	248	230
15	295	560	574	462	382	622	509	837	562	462	248	318
16	295	496	541	420	348	761	562	915	562	462	248	420
17	481	448	514	462	348	761	509	915	509	382	268	420
18	456	456	490	1,360	462	761	622	1,170	509	382	248	348
19	373	481	458	1,360	420	761	562	1,560	509	348	248	318
20	355	1,440	441	995	382	837	562	1,260	462	318	268	291
21	338	2,260	441	761	382	915	689	1,170	509	318	248	268
22	321	1,960	441	689	348	995	689	1,170	462	318	248	268
23	321	2,360	725	562	348	1,170	761	995	462	291	230	248
24	355	1,680	1,100	562	348	995	915	915	420	318	230	248
25	355	1,230	1,040	509	348	915	1,080	837	382	318	230	248
26	327	955	747	462	318	761	915	761	509	318	230	268
27	300	853	689	462	291	689	837	689	689	291	230	248
28	295	837	676	420	318	622	689	761	562	291	230	248
29	286	979	622	382	....	622	622	837	509	291	230	248
30	284	1,100	649	622	....	837	689	915	462	291	268	230
31	274	....	592	689	....	995	....	995	....	291	248	....

NOTE.—Discharge determined from a fairly well defined rating curve.

Monthly discharge of Sandy River above Salmon River, at Brightwood, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	908	274	377	23,200	B.
November	2,360	277	958	57,000	B.
December	1,460	441	830	51,000	B.
January	1,360	382	629	38,700	B.
February	689	291	415	23,000	B.
March	1,170	318	657	40,400	B.
April	1,170	462	678	40,300	B.
May	1,560	689	946	58,200	B.
June	1,080	382	637	37,900	B.
July	462	291	372	22,900	A.
August	291	230	255	15,700	A.
September	420	230	287	17,100	A.
The year	2,380	230	587	425,400	

SANDY RIVER BELOW SALMON RIVER, NEAR BRIGHTWOOD, OREG.

Location.—In sec. 22, T. 2 S., R. 6 E., at the county highway bridge, 1½ miles below the post office at Brightwood, and 1 mile below the mouth of Salmon River.

Records available.—December 12, 1907, to September 30, 1911.

Drainage area.—200 square miles.

Gage.—Standard chain on upstream side of highway bridge.

Channel.—Rocks and bowlders; somewhat shifting.

Discharge measurements.—Made from highway bridge.

Accuracy.—Records rendered somewhat uncertain because of shifting channel and unsatisfactory gage record.

Discharge measurements of Sandy River below Salmon, River near Brightwood, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
June 26	W. O. Harmon	3.80	587
July 17	.....do	3.61	551

Daily gage height in feet of Sandy River below Salmon River, near Brightwood, Oreg., for the year ending Sept. 30, 1911.

[J. C. McIntyre, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	3.25	4.5	5.35	4.35	4.7	3.5	5.6	4.8	5.4	3.95	3.35	3.05
2	3.15	4.55	5.7	4.3	4.5	3.5	5.5	4.95	5.3	3.9	3.3	3.05
3	4.1	4.65	6.0	4.45	4.45	3.55	5.2	5.1	5.1	4.0	3.3	3.05
4	4.65	4.65	6.05	4.5	4.3	3.75	5.1	5.2	4.85	3.95	3.25	3.05
5	4.75	4.6	5.9	4.6	4.3	3.7	4.8	5.3	4.75	3.9	3.25	4.1
6	4.3	4.7	5.8	4.75	4.25	3.75	4.65	5.0	4.8	3.9	3.3	3.85
7	4.15	5.3	5.85	4.85	4.2	4.0	4.6	5.2	4.75	4.0	3.25	3.6
8	4.05	6.3	5.85	4.8	4.15	4.05	4.65	5.3	4.7	3.95	3.25	3.85
9	4.05	6.3	5.7	4.7	4.15	4.1	4.6	5.3	4.6	3.9	3.25	4.15
10	3.95	6.45	5.55	4.55	4.15	4.1	4.65	5.3	4.55	3.85	3.3	3.8
11	3.8	6.3	5.5	4.3	4.1	4.1	4.6	5.3	4.6	3.85	3.25	3.65
12	3.8	5.95	5.35	4.15	4.1	4.15	4.5	5.3	4.5	3.8	3.25	3.55
13	3.8	5.75	5.2	4.05	4.0	4.2	4.4	5.4	4.5	3.8	3.2	3.5
14	3.8	4.95	4.95	4.0	3.95	4.25	4.4	5.3	4.35	3.8	3.2	3.4
15	3.85	4.4	4.75	4.0	3.9	4.45	4.45	5.3	4.3	3.85	3.2	4.1
16	3.85	4.3	4.4	3.95	3.85	4.6	4.4	5.3	4.2	3.8	3.15	4.25
17	4.55	4.35	4.3	3.9	3.8	4.75	4.4	5.3	4.1	3.7	3.15	4.2
18	4.65	4.35	4.25	4.95	4.15	4.85	4.6	5.5	4.05	3.6	3.2	4.0
19	4.55	4.95	4.2	5.15	4.1	4.95	4.55	6.2	4.05	3.55	3.15	3.85
20	4.5	6.05	4.2	4.85	4.0	5.1	4.5	5.9	4.0	3.45	3.15	3.75
21	4.5	7.6	4.55	4.6	3.95	5.2	4.7	5.7	3.95	3.45	3.15	3.7
22	4.55	6.45	4.8	4.55	3.9	5.3	4.7	5.7	3.95	3.4	3.1	3.7
23	4.65	6.9	4.95	4.45	3.85	5.3	4.75	5.5	4.0	3.35	3.05	3.7
24	4.6	6.3	5.15	4.4	3.85	5.5	4.95	5.4	3.9	3.4	3.05	3.65
25	4.6	5.7	5.1	4.25	3.8	5.3	5.1	5.3	3.8	3.5	3.05	3.65
26	4.55	5.4	4.95	4.15	3.8	5.1	4.85	5.3	3.85	3.4	3.05	3.7
27	4.55	5.15	4.85	4.05	3.65	4.95	4.8	5.1	4.3	3.35	3.1	3.65
28	4.55	5.1	4.7	4.0	3.55	4.85	4.7	5.1	4.1	3.35	3.05	3.65
29	4.55	4.95	4.7	3.9	......	4.75	4.65	5.0	4.1	3.3	3.05	3.6
30	4.5	5.0	4.65	4.05	......	4.85	4.6	5.1	4.0	3.3	3.05	3.6
31	4.5	......	4.5	4.1	......	5.0	......	5.3	......	3.3	3.1	......

Daily discharge, in second-feet, of Sandy River below Salmon River, near Brightwood, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	388	370	1,900	978	1,270	428	2,160	1,360	1,950	710	435	318
2	345	380	2,260	938	1,100	428	2,050	1,500	1,840	680	410	318
3	920	470	2,600	1,060	1,060	453	1,740	1,650	1,650	760	410	318
4	1,380	430	2,660	1,100	938	562	1,650	1,740	1,410	730	388	318
5	1,040	420	2,490	1,190	938	533	1,360	1,840	1,320	695	388	660
6	700	540	2,380	1,320	900	562	1,230	1,550	1,360	700	410	550
7	600	1,840	2,430	1,410	862	720	1,190	1,740	1,320	780	388	420
8	540	2,950	2,430	1,360	826	755	1,230	1,840	1,270	748	388	320
9	530	2,950	2,260	1,270	826	790	1,190	1,840	1,190	720	388	470
10	480	3,120	2,100	1,140	826	790	1,230	1,840	1,140	690	410	430
11	410	2,950	2,050	938	790	790	1,190	1,840	1,190	695	388	380
12	390	2,540	1,900	826	790	826	1,100	1,840	1,100	668	388	350
13	380	2,320	1,740	755	720	862	1,020	1,950	1,100	670	365	330
14	380	1,500	1,500	720	686	900	1,020	1,840	978	672	365	320
15	380	1,020	1,320	720	653	1,060	1,060	1,840	938	715	365	600
16	420	938	1,020	686	622	1,190	1,020	1,840	862	690	345	770
17	540	978	938	653	591	1,320	1,020	1,840	790	630	345	740
18	630	978	900	1,500	826	1,410	1,190	2,050	755	570	365	600
19	590	1,500	862	1,700	790	1,500	1,140	2,830	755	540	345	520
20	520	2,660	862	1,410	720	1,650	1,100	2,490	720	485	345	470
21	460	4,530	1,140	1,190	686	1,740	1,270	2,260	686	485	345	440
22	430	3,120	1,360	1,140	653	1,840	1,270	2,260	686	460	325	420
23	420	3,660	1,500	1,060	622	1,840	1,320	2,050	720	435	318	390
24	450	2,950	1,700	1,020	622	2,050	1,500	1,950	653	460	318	380
25	480	2,260	1,650	900	591	1,840	1,650	1,840	591	510	318	370
26	430	1,950	1,500	826	591	1,650	1,410	1,840	622	460	318	360
27	420	1,700	1,410	755	506	1,500	1,360	1,650	940	435	325	360
28	400	1,650	1,270	720	453	1,410	1,270	1,650	800	435	318	350
29	380	1,500	1,270	653	......	1,320	1,230	1,550	800	410	318	350
30	370	1,550	1,230	755	......	1,410	1,190	1,650	740	410	318	350
31	370	......	1,100	790	......	1,550	......	1,840	......	410	325	......

NOTE.—Discharge determined from several fairly well defined rating curves, and from hydrograph comparisons with records at adjacent stations.

Monthly discharge of Sandy River below Salmon River, near Brightwood, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	1,380	345	522	32,100	C.
November	4,530	370	1,860	111,000	C.
December	2,660	862	1,670	103,000	C.
January	1,700	653	1,020	62,700	C.
February	1,270	453	766	42,500	C.
March	2,050	428	1,150	70,700	C.
April	2,160	1,020	1,310	78,000	B.
May	2,830	1,360	1,860	114,000	B.
June	1,950	591	1,030	61,300	B.
July	780	410	595	36,600	B.
August	435	318	361	22,200	B.
September	770	318	432	25,700	C.
The year	4,530	318	1,050	760,000	

SANDY RIVER NEAR MARMOT, OREG.

Location.—In sec. 24, T. 2 S., R. 5 E., at the Van der Hoof ranch, about 1½ miles above Marmot and about 5 miles below Brightwood.

Records available.—August 15 to September 30, 1911.

Drainage area.—Not measured.

Gage.—A Friez automatic gage referred to a vertical staff on the stilling well.

Channel.—Rocks and gravel; may shift slightly.

Discharge measurements.—Made from a cable and car about 1 mile below gage.

Cooperation.—Gage records furnished by the Mount Hood Railway and Power Co., which cooperated in the installing of the equipment.

Estimates withheld for additional data.

Discharge measurements of Sandy River near Marmot, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Aug. 26	E. S. Fuller	1.03	308
Sept. 20	R. W. Davenport	1.45	484

Daily gage height, in feet, of Sandy River near Marmot, Oreg., for the year ending Sept. 30, 1911.

[Henry Helms, observer.]

Day.	Aug.	Sept.	Day.	Aug.	Sept.	Day.	Aug.	Sept.
1		1.11	11		1.26	21	1.14	1.36
2		1.17	12		1.20	22	1.12	1.27
3		1.19	13		1.16	23	1.10	1.23
4		1.20	14		1.16	24	1.08	1.20
5		1.96	15	1.12	1.73	25	1.08	1.15
6		1.72	16	1.14	2.28	26	1.08	1.22
7		1.37	17	1.19	2.23	27	1.08	1.18
8		1.22	18	1.18	1.83	28	1.07	1.15
9		1.72	19	1.20	1.59	29	1.09	1.10
10		1.43	20	1.19	1.45	30	1.12	1.07
						31	1.15	

SANDY RIVER ABOVE BULL RUN RIVER, NEAR BULL RUN, OREG.

Location.—In sec. 12, T. 2 S., R. 4 E., 100 feet above the proposed dam site, half a mile below the mouth of Cedar Creek, 2 miles above the mouth of Bull Run River, and 2 miles southwest of Bull Run post office.

Records available.—May 8, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Staff in two sections; the lower inclined, the upper vertical.

Channel.—Gravel and bowlders; control permanent.

Discharge measurements.—Made from car and cable at gage.

Accuracy.—Results excellent.

Cooperation.—Established by the Mount Hood Railway & Power Co., which furnished the gage record.

Discharge measurements of Sandy River above Bull Run River, near Bull Run, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 19	E. S. Fuller	4.20	3,410
July 16	W. O. Harmon	1.85	672
Sept. 18	R. W. Davenport	1.85	656

Daily gage height, in feet, of Sandy River above Bull Run River, near Bull Run, Oreg., for the year ending Sept. 30, 1911.

[Henry Oak, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.80	1.38	3.25	2.60	3.0	1.90	3.6	3.0	3.4	2.25	1.50	1.31
2	1.74	1.36	3.72	2.50	3.0	1.88	3.4	3.1	3.3	2.20	1.50	1.35
3	3.15	1.51	4.10	2.40	2.80	1.90	3.1	3.4	3.0	2.10	1.50	1.35
4	3.10	1.65	4.20	2.40	2.70	2.10	2.90	3.5	2.90	2.10	1.50	1.40
5	2.51	1.51	3.90	2.50	2.60	2.15	2.70	3.6	2.80	2.10	1.50	2.20
6	2.25	1.53	3.54	2.40	2.50	2.20	2.60	3.3	2.75	2.10	1.50	1.80
7	1.95	2.10	3.50	2.90	2.40	2.60	2.50	3.4	2.75	2.00	1.50	1.60
8	1.80	4.21	3.40	2.65	2.35	2.70	2.50	3.4	2.65	1.80	1.50	1.40
9	1.75	3.55	3.84	3.1	2.30	2.70	2.60	3.1	2.60	1.80	1.45	1.60
10	1.75	4.85	3.50	2.90	2.30	2.70	2.80	3.3	2.80	1.85	1.40	......
11	1.69	4.60	3.20	2.80	2.40	2.70	2.60	3.1	3.2	1.80	1.40	......
12	1.59	3.75	3.00	2.60	2.40	2.60	2.50	3.2	3.4	1.80	1.40	1.40
13	1.52	3.28	2.80	2.50	2.35	2.50	2.45	3.4	2.70	1.85	1.40	1.40
14	1.44	2.81	2.72	2.35	2.30	2.60	2.30	3.4	2.60	1.85	1.40	1.35
15	1.42	2.56	2.62	2.30	2.20	2.80	2.50	3.3	2.50	1.95	1.40	1.85
16	1.44	2.39	2.50	2.22	2.15	3.0	2.50	3.3	2.40	1.90	1.40	2.05
17	1.60	2.25	2.45	2.25	2.10	3.0	2.55	3.3	2.35	1.90	1.40	2.00
18	2.21	2.39	2.35	4.6	2.35	3.0	2.70	3.8	2.25	1.80	1.40	2.00
19	1.91	2.50	2.25	4.7	2.30	2.90	2.80	4.2	2.20	1.75	1.40	1.80
20	1.79	2.78	2.22	4.0	2.30	3.1	2.70	4.0	2.15	1.70	1.40	1.60
21	1.65	5.60	2.25	3.5	2.20	3.2	2.90	3.9	2.10	1.65	1.40	1.55
22	1.60	4.85	2.15	2.85	2.15	3.3	2.90	3.6	2.10	1.60	1.40	1.50
23	1.57	5.85	2.68	2.90	2.10	3.6	3.0	3.4	2.05	1.60	1.40	1.45
24	1.52	4.40	3.40	2.80	2.05	3.4	3.3	3.3	2.00	1.60	1.35	1.40
25	1.81	3.80	3.32	2.70	2.05	3.4	3.6	3.1	2.00	1.65	1.30	1.40
26	1.62	3.30	2.98	2.55	2.10	3.0	3.3	3.1	2.00	1.70	1.30	1.40
27	1.52	3.10	2.99	2.50	1.90	2.85	3.1	3.0	2.50	1.55	1.20	1.40
28	1.48	3.10	2.80	2.40	1.85	2.70	2.90	2.90	2.25	1.55	1.20	1.40
29	1.45	3.20	2.74	2.30	......	2.70	2.80	3.0	2.35	1.55	1.30	1.35
30	1.42	3.72	2.82	2.40	......	3.0	2.90	3.1	2.25	1.55	1.30	1.32
31	1.40	......	2.72	2.40	......	3.4	......	3.4	......	1.51	1.35	......

Daily discharge, in second-feet, of Sandy River above Bull Run River, near Bull Run, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	385	421	2,120	1,310	1,780	700	2,550	1,780	2,280	978	472	388
2	618	412	2,770	1,210	1,780	687	2,280	1,900	2,150	934	472	405
3	1,980	485	3,340	1,110	1,540	700	1,900	2,280	1,780	850	472	405
4	1,920	560	3,490	1,110	1,420	850	1,660	2,410	1,660	850	472	426
5	1,250	485	3,040	1,210	1,310	892	1,420	2,550	1,540	850	472	934
6	1,000	495	2,520	1,110	1,210	934	1,310	2,150	1,480	850	472	635
7	765	830	2,460	1,660	1,110	1,310	1,210	2,280	1,480	772	472	522
8	660	3,500	2,320	1,360	1,070	1,420	1,210	2,280	1,360	635	472	426
9	625	4,030	2,950	1,900	1,020	1,420	1,310	1,900	1,310	635	449	522
10	625	4,510	2,460	1,660	1,020	1,420	1,540	2,150	1,540	668	426	490
11	584	4,110	2,050	1,540	1,110	1,420	1,310	1,900	1,500	635	426	458
12	525	2,820	1,800	1,310	1,110	1,310	1,210	2,020	1,460	635	426	426
13	490	2,150	1,560	1,210	1,070	1,210	1,160	2,280	1,420	668	426	426
14	450	1,570	1,470	1,070	1,020	1,310	1,020	2,280	1,310	668	426	405
15	440	1,300	1,360	1,020	934	1,540	1,210	2,150	1,210	736	426	668
16	450	1,130	1,240	952	892	1,780	1,210	2,150	1,110	700	426	811
17	530	1,000	1,190	978	850	1,780	1,260	2,150	1,070	700	426	772
18	969	1,130	1,100	4,040	1,070	1,780	1,420	2,830	978	635	426	772
19	737	1,240	1,000	4,200	1,020	1,660	1,540	3,420	934	606	426	635
20	653	1,540	978	3,120	1,020	1,900	1,420	3,120	892	576	426	522
21	560	5,720	1,000	2,410	934	2,020	1,660	2,970	850	549	426	497
22	530	4,510	920	1,600	892	2,150	1,660	2,550	850	522	426	472
23	515	6,140	1,430	1,660	850	2,550	1,780	2,280	811	522	426	449
24	490	3,790	2,320	1,540	811	2,280	2,150	2,150	772	522	405	426
25	667	2,890	2,210	1,420	811	2,280	2,550	1,900	772	549	384	426
26	542	2,180	1,780	1,260	850	1,780	2,150	1,900	772	576	384	426
27	490	1,920	1,790	1,210	700	1,600	1,900	1,780	1,210	497	346	426
28	470	1,920	1,560	1,110	668	1,420	1,660	1,660	978	497	346	426
29	455	2,050	1,490	1,020	....	1,420	1,540	1,780	1,070	497	384	405
30	440	2,770	1,580	1,110	....	1,780	1,660	1,900	978	497	384	392
31	430	....	1,470	1,110	....	2,280	....	2,280	.....	477	405	....

NOTE.—Discharge Oct. 1 to Dec. 31, 1910, determined from a rating curve well defined between 380 and 4,000 second-feet. Discharge Jan. 1 to Sept. 30, 1911, determined from a rating curve well defined between 350 and 6,000 second-feet.

Monthly discharge of Sandy River above Bull Run River, near Bull Run, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	1,980	385	685	42,100	A.
November	6,140	412	2,260	134,000	A.
December	3,490	920	1,900	117,000	A.
January	4,200	952	1,570	96,500	A.
February	1,780	668	1,070	59,400	A.
March	2,550	687	1,530	94,100	A.
April	2,550	1,020	1,600	95,200	A.
May	3,420	1,660	2,230	137,000	A.
June	2,280	772	1,250	74,400	A.
July	978	477	654	40,200	A.
August	472	346	427	26,300	A.
September	934	388	513	30,500	A.
The year	4,200	346	1,310	947,000	

SANDY RIVER BELOW BULL RUN RIVER, NEAR BULL RUN, OREG.

Location.—In sec. 30, T. 1 S., R. 5 E., about 1,000 feet below the mouth of Bull Run River and 1½ miles northwest of Bull Run.

Records available.—April 27, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Staff in two sections; the lower section vertical, the upper inclined.

Channel.—Rocks and gravel; may shift slightly.

Discharge measurements.—Made from a footbridge just below the gage.

Accuracy.—Results good.

Cooperation.—Gage-height records furnished by the Mount Hood Railway & Power Co., which installed the equipment.

Discharge measurements of Sandy River below Bull Run River, near Bull Run, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 20	E. S. Fuller	4.02	4,820
Sept. 18	R. W. Davenport	1.96	1,370

Daily gage height, in feet, of Sandy River below Bull Run River, near Bull Run, Oreg., for the year ending Sept. 30, 1911.

[G. B. Cross, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.1	0.85	4.0	2.5	2.6	1.8	2.6	3.1	3.0	2.6	1.1	0.69
2	1.82	.85	4.0	2.5	2.6	1.8	2.6	3.1	2.9	2.0	1.1	.69
3	3.85	.85	4.5	2.5	2.6	1.8	2.4	3.1	2.8	2.0	1.05	.9
4	3.8	.85	5.5	2.4	2.5	1.8	2.4	3.5	2.8	1.9	1.05	1.4
5	2.15	.85	5.0	2.4	2.5	1.9	2.4	3.0	2.8	1.8	1.05	1.9
6	2.0	.85	5.0	2.3	2.5	1.9	2.4	3.0	2.7	1.8	1.05	1.8
7	1.8	2.0	4.8	2.3	2.4	2.0	2.4	3.0	2.6	1.8	1.05	1.6
8	1.7	4.35	4.5	2.4	2.3	2.8	2.4	3.0	2.6	1.7	1.0	1.0
9	1.4	5.5	4.0	2.5	2.0	2.8	2.4	3.1	2.5	1.6	1.0	1.2
10	1.4	5.5	3.5	3.0	2.0	3.0	2.4	3.1	2.5	1.5	1.0	.9
11	1.4	4.5	3.0	2.5	2.0	3.7	2.3	3.3	2.5	1.5	1.0	1.0
12	1.4	4.1	2.8	2.5	3.0	3.4	2.3	3.4	2.5	1.4	1.0	1.1
13	1.7	4.0	2.5	2.5	4.0	3.0	2.3	3.5	2.5	1.4	1.0	1.1
14	1.5	3.5	2.5	2.3	3.5	2.8	2.3	3.5	2.4	1.5	1.0	1.0
15	1.2	2.5	2.5	2.3	3.0	2.8	2.3	3.5	2.4	1.5	.95	1.0
16	1.1	2.6	2.4	2.3	3.0	2.8	2.4	3.5	2.3	1.5	.95	2.45
17	3.0	2.6	2.3	2.5	2.7	2.7	2.4	3.5	2.2	1.5	.95	2.0
18	2.5	2.6	2.0	7.5	2.0	2.7	2.4	3.6	2.0	1.4	.95	1.9
19	2.4	2.6	2.0	6.0	2.0	2.8	2.5	4.8	1.9	1.4	.95	1.8
20	1.9	3.75	2.0	4.5	2.0	3.0	2.5	4.1	1.9	1.3	.95	1.7
21	1.7	6.0	2.0	4.0	2.0	3.0	2.7	3.8	1.8	1.25	.9	1.2
22	1.6	6.0	3.0	3.8	2.0	3.0	2.7	3.8	1.7	1.2	.85	1.1
23	1.4	6.25	3.5	3.3	2.0	3.0	2.8	3.6	1.6	1.2	.85	1.1
24	1.5	5.75	3.5	3.0	2.0	3.1	3.0	3.2	1.6	1.2	.85	1.1
25	1.3	5.5	3.4	2.8	2.0	3.2	3.0	3.2	1.6	1.2	.85	1.0
26	1.2	3.0	3.4	2.8	2.0	3.0	3.2	3.2	1.7	1.2	.8	1.0
27	1.0	3.0	3.2	2.8	2.0	3.0	3.2	3.2	1.9	1.2	.8	1.0
28	.95	3.0	3.2	2.8	1.9	2.8	3.2	3.1	3.0	1.2	.8	1.0
29	.95	4.0	3.0	2.7	......	2.8	3.0	3.0	2.8	1.1	.75	1.0
30	.94	4.5	2.5	2.7	......	2.7	3.0	3.0	2.6	1.1	.75	1.0
31	.92	......	2.5	2.7	......	2.6	......	3.1	......	1.1	.7	......

Daily discharge, in second-feet, of Sandy River below Bull Run River, near Bull Run., Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	600	455	4,880	2,080	2,220	1,220	2,220	3,030	2,860	2,220	600	376
2	1,240	455	4,880	2,080	2,220	1,220	2,220	3,030	2,690	1,440	600	376
3	4,540	455	6,120	2,080	2,220	1,220	1,940	3,030	2,530	1,440	570	480
4	4,430	455	9,000	1,940	2,080	1,220	1,940	3,790	2,530	1,330	570	830
5	1,620	455	7,500	1,940	2,080	1,330	1,940	2,860	2,530	1,220	570	1,330
6	1,440	455	7,500	1,810	2,080	1,330	1,940	2,860	2,370	1,220	570	1,220
7	1,220	1,440	6,940	1,810	1,940	1,440	1,940	2,860	2,220	1,220	570	1,020
8	1,120	5,740	6,120	1,940	1,810	2,530	1,940	2,860	2,220	1,120	540	540
9	830	9,000	4,880	2,080	1,440	2,530	1,940	3,030	2,080	1,020	540	670
10	830	9,000	3,790	2,860	1,440	2,860	1,940	3,030	2,080	920	540	480
11	830	6,120	2,860	2,080	1,440	4,210	1,810	3,400	2,080	920	540	540
12	830	5,120	2,530	2,080	2,860	3,590	1,810	3,590	2,080	830	540	600
13	1,120	4,880	2,080	2,080	4,880	2,860	1,810	3,790	2,080	830	540	600
14	920	3,790	2,080	1,810	3,790	2,530	1,810	3,790	1,940	920	540	540
15	670	2,080	2,080	1,810	2,860	2,530	1,810	3,790	1,940	920	510	540
16	600	2,220	1,940	1,810	2,860	2,530	1,940	3,790	1,810	920	510	2,010
17	2,860	2,220	1,810	2,080	2,370	2,370	1,940	3,790	1,680	920	510	1,440
18	2,080	2,220	1,440	15,600	1,440	2,370	1,940	4,000	1,440	830	510	1,330
19	1,940	2,220	1,440	10,600	1,440	2,530	2,080	6,940	1,330	830	510	1,220
20	1,330	4,320	1,440	6,120	1,440	2,860	2,080	5,120	1,330	750	510	1,120
21	1,120	10,600	1,440	4,880	1,440	2,860	2,370	4,430	1,220	710	480	670
22	1,020	10,600	2,860	4,430	1,440	2,860	2,370	4,430	1,120	670	455	600
23	830	11,400	3,790	3,400	1,440	2,860	2,530	4,000	1,020	670	455	600
24	920	9,800	3,790	2,860	1,440	3,030	2,860	3,210	1,020	670	455	600
25	750	9,000	3,590	2,530	1,440	3,210	2,860	3,210	1,020	670	455	540
26	670	2,860	3,590	2,530	1,440	2,860	3,210	3,210	1,120	670	430	540
27	540	2,860	3,210	2,530	1,440	2,860	3,210	3,210	1,330	670	430	540
28	510	2,860	3,210	2,530	1,330	2,530	3,210	3,030	2,860	670	430	540
29	510	4,880	2,860	2,370	....	2,530	2,860	2,860	2,530	600	405	540
30	504	6,120	2,080	2,370	....	2,370	2,860	2,860	2,220	600	405	540
31	492	....	2,080	2,370	....	2,220	....	3,030	....	600	380	....

Note.—Discharge determined from a rating curve well defined between 450 and 5,500 second-feet.

Monthly discharge of Sandy River below Bull Run River, near Bull Run, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	4,540	492	1,260	77,500	B.
November	11,400	455	4,470	266,000	B.
December	9,000	1,440	3,670	226,000	B.
January	15,600	1,810	3,210	197,000	B.
February	4,880	1,330	2,010	112,000	B.
March	4,210	1,220	2,430	149,000	B.
April	3,210	1,810	2,240	133,000	B.
May	6,940	2,860	3,540	218,000	B.
June	2,860	1,020	1,910	114,000	B.
July	2,220	600	936	57,600	B.
August	600	380	505	31,100	B.
September	2,010	376	766	45,600	B.
The year	15,600	376	2,250	1,630,000	

STILL CREEK NEAR ROWE, OREG.[1]

Location.—In sec. 24, T. 3 S., R. 8½ E., half a mile above Summit House, about 1½ miles southeast of Government Camp, and about 11 miles southeast of Rowe.

Records available.—May 23, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Sand and gravel; shifting.

Discharge measurements.—Made from a foot log or by wading near the gage.

Accuracy.—Record only fair.

Cooperation.—Gage installed and gage heights furnished by the Mount Hood Railway & Power Co.

Discharge measurements of Still Creek near Rowe, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
1910. Nov. 21	John Dubuis	1.25	20.1	1911. July 16	W. O. Harmon	[a]1.17	17.9
1911. June 24	W. O. Harmon	1.22	18.8	Oct. 24	R. C. Pierce	1.15	8.8

[a] Observer's gage reading for day.

Daily gage height, in feet, of Still Creek near Rowe, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.92	1.04				1.10		1.35	1.22	1.13	1.06
2	.95	1.05						1.30	1.21	1.12	1.06
3	1.15	1.08						1.33		1.12	1.08
4	1.10	1.12		1.00	1.11			1.30	1.20	1.12	1.09
5	1.05	1.15							1.19	1.12	1.16
6	1.04	1.19					1.20		1.18	1.12	1.15
7	1.02	1.27	1.20						1.19	1.12	1.12
8	1.00	1.24				1.05			1.19	1.12	1.12
9	.99	1.32							1.19	1.11	1.19
10	.99							1.27		1.11	1.12
11	1.02			1.10	1.00			1.27	1.18	1.11	1.11
12	1.02								1.18	1.11	1.11
13	1.02						1.10		1.18	1.11	1.11
14	1.02		1.10				1.14		1.17	1.10	1.10
15	1.02					1.02	1.20	1.27	1.17	1.10	1.11
16	1.02						1.23	1.26	1.17	1.10	1.12
17	1.10						1.29	1.26	1.17	1.10	1.14
18	1.07			1.18	1.10		1.30	1.26	1.17	1.10	1.12
19	1.05						1.25		1.16	1.08	1.10
20	1.04						1.26		1.16	1.10	1.09
21	1.03		1.19						1.16	1.09	1.09
22	1.03					1.10			1.15	1.09	1.08
23	1.03								1.15	1.09	1.07
24	1.03							1.22	1.15	1.08	1.07
25	1.05			1.20	1.60			1.23	1.15	1.08	1.07
26	1.05								1.14	1.07	1.08
27	1.05						1.23		1.14	1.07	1.07
28	1.05		1.23						1.13	1.07	1.07
29	1.05					1.11			1.12	1.07	1.07
30	1.04						1.26	1.23	1.12	1.07	1.07
31	1.04								1.12	1.06	

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[1] Previously described as Still Creek near Government Camp, Oreg.

Daily discharge, in second-feet, of Still Creek near Rowe, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	12	15	19	17	17	16	17	24	20	17	15
2	13	15	19	16	17	16	17	22	19	17	15
3	18	16	19	15	16	16	18	23	19	17	16
4	16	17	19	14	16	16	18	22	19	17	16
5	15	18	19	14	16	15	19	22	19	17	18
6	15	19	19	14	16	15	19	22	18	17	18
7	14	21	19	15	15	15	19	22	19	17	17
8	14	20	18	15	15	15	18	21	19	17	17
9	14	22	18	16	14	15	18	21	19	16	19
10	14	....	18	16	14	15	17	21	18	16	17
11	14	....	17	16	14	15	17	21	18	16	16
12	14	....	17	16	14	14	16	21	18	16	16
13	14	....	17	16	14	14	16	21	18	16	16
14	14	....	16	17	15	14	17	21	18	16	16
15	14	....	16	17	15	14	19	21	18	16	16
16	14	....	17	18	16	14	20	21	18	16	17
17	16	....	17	18	16	14	22	21	18	16	17
18	15	....	18	18	16	15	22	21	18	16	17
19	15	....	18	18	19	15	20	21	18	16	16
20	15	....	19	18	22	16	21	21	18	16	16
21	15	....	19	18	24	16	21	21	18	16	16
22	15	....	19	19	25	16	21	20	18	16	16
23	15	....	19	19	27	16	21	20	18	16	15
24	15	....	19	19	30	16	20	20	18	16	15
25	15	....	20	19	33	16	20	20	18	16	15
26	15	....	20	19	30	16	20	20	17	15	16
27	15	....	20	18	27	16	20	20	17	15	15
28	15	....	20	18	25	16	20	20	17	15	15
29	15	....	19	....	24	16	21	20	17	15	15
30	15	....	18	....	22	16	21	20	17	15	15
31	15	....	17	....	19	....	22	....	17	15	....

NOTE.—Discharge determined from a fairly well defined rating curve.

Monthly discharge of Still Creek near Rowe, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	18	12	14.7	904	B.
November 1-9	22	15	18.1	323	B.
December	....	....	....	....	
January	20	16	18.4	1,130	B.
February	19	14	16.9	939	B.
March	33	14	19.5	1,200	C.
April	16	14	15.3	910	B.
May	22	16	19.3	1,190	B.
June	24	20	21.0	1,250	B.
July	20	17	18.1	1,110	A.
August	17	15	16.1	990	A.
September	19	15	16.1	958	A.

SALMON RIVER NEAR ROWE, OREG.[1]

Location.—In sec. 31, T. 3 S., R. 9 E., about 4 miles southeast of Government Camp, and 14 miles southeast of Rowe.

Records available.—May 24, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Friez automatic gage referred to vertical staff in two sections. Automatic gage installed November 21, 1910.

Channel.—Shifting gravel.

Discharge measurements.—Made by wading or from foot log near gage.

Accuracy.—Results fair.

Cooperation.—Gage record furnished by the Mount Hood Railway & Power Co., which maintained the equipment.

Discharge measurements of Salmon River near Rowe, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Nov. 21	John Dubuis	1.35	77.2	June 24	W. O. Harmon	[a] 0.77	49.2
				July 19	do	.60	26.7

[a] Observer's gage reading for the day.

Daily gage height, in feet, of Salmon River near Rowe, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.63	0.45	1.13	0.88	0.55	0.43	0.76	0.88		0.78	0.49	0.39
2	.67	.47	1.21	.86	.53	.42	.73	.94			.52	.41
3	.95	.52	1.27	.83	.52	.41	.67	.99	1.10		.50	.43
4	.80	.57	1.33	.82	.51	.41	.64	1.04	1.06		.48	.41
5	.70	.58	1.38	.81	.51	.41	.62	1.05	1.02		.48	.67
6	.65	.60	1.41	.84	.50	.42	.62	.94	1.05		.50	.69
7	.60	.69	1.44	.84	.49	.45	.64	.92	1.06		.51	.69
8	.54	.65	1.46	.84	.48	.45	.66	1.09	1.01	.68	.50	.68
9	.50	.76	1.46	.80	.48	.39	.66	.92	1.00	.66	.47	.75
10	.50		1.46	.77	.48	.38	.64	.89	1.02	.65	.44	.59
11	.50		1.44	.74	.48	.38	.58	.88		.65	.46	.54
12	.52		1.36	.73	.48	.40	.55	.96		.65	.46	.55
13	.52		1.28	.72	.48	.42	.53	.92		.65	.48	.55
14	.52		1.18	.65	.47	.41	.53	.94		.65	.49	.51
15	.51		1.13	.60	.47	.39	.55	.95		.65	.46	.59
16	.51		1.08	.60	.47	.39	.60	.96		.66	.45	.65
17	.65		1.02	.59	.47	.39	.58	.96	.92	.64	.45	.63
18	.56		.99	.61	.47	.39	.63	1.07		.61	.44	.53
19	.50		.96	.65	.47	.44	.57	1.04		.60	.44	.50
20	.49		.93	.59	.47	.49	.58	.97		.59	.43	.47
21	.48	1.30	.88	.60	.46	.53	.71	1.01		.57	.43	.47
22	.47	1.10	.92	.58	.46	.58	.77	1.08		.57	.42	.46
23	.46	1.28	1.04	.57	.45	.66	.83	1.04		.58	.42	.46
24	.48	.96	.94	.57	.45	.59	.93	.99	.77	.57	.42	.42
25	.49	.94	.88	.57	.44	.54	.97	.95	.86	.58	.42	.42
26	.49	.95	.87	.56	.43	.52	.89	.93	.89	.58	.40	.44
27	.49	.99	.87	.53	.54	.50	.86	.93	.84	.58	.40	.41
28	.48	1.02	.86	.52	.58	.51	.80		.84	.57	.40	.41
29	.46	1.06	.84	.52		.56	.81		.83	.56	.40	.39
30	.46	1.08	.88	.61		.62	.87		.81	.49	.40	.38
31	.45		.91	.58		.71				.47	.39	

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[1] Previously described as Salmon Creek near Government Camp, Oreg.

Daily discharge, in second-feet, of Salmon River near Rowe, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	22	15	54	47	26	20	38	47	61	40	23	19
2	24	16	61	45	24	20	36	51	63	39	24	19
3	40	18	66	43	24	19	32	55	65	38	23	20
4	30	20	72	42	24	19	30	60	61	37	22	19
5	25	20	77	42	24	19	29	60	58	36	22	32
6	23	21	80	44	23	20	29	51	60	35	23	33
7	21	25	83	44	23	21	30	50	61	34	24	33
8	19	23	85	44	22	21	32	64	57	33	23	33
9	17	28	102	41	22	19	32	50	56	32	22	38
10	17	36	102	39	22	18	30	47	58	31	21	28
11	17	60	99	37	22	18	27	47	57	31	21	25
12	18	60	91	36	22	19	26	53	56	31	21	26
13	18	51	83	35	22	20	24	50	55	31	22	26
14	18	40	73	31	22	19	24	51	53	31	23	24
15	17	30	68	28	22	19	26	52	52	31	21	28
16	17	28	63	28	22	19	28	53	51	32	21	31
17	23	28	58	28	22	19	27	53	50	30	21	30
18	19	30	55	29	22	19	30	62	48	29	21	24
19	17	43	53	31	22	21	26	60	46	28	21	23
20	17	60	50	28	22	23	27	54	45	28	20	22
21	16	69	47	28	21	24	35	57	44	26	20	22
22	16	51	50	27	21	27	39	63	43	26	20	21
23	15	67	60	26	21	32	43	60	41	27	20	21
24	16	40	51	26	21	28	50	55	39	26	20	20
25	17	39	47	26	21	25	54	52	45	27	20	20
26	17	40	46	26	20	24	47	50	47	27	19	21
27	17	42	46	24	25	23	45	50	44	27	19	19
28	16	45	45	24	27	24	41	52	44	26	19	19
29	15	48	44	24	....	26	42	54	43	26	19	19.
30	15	49	47	29	....	29	46	56	42	23	19	18
31	15	....	49	27	....	35	....	59	....	22	19	....

NOTE.—Discharge Oct. 1, to Dec. 8, 1910, determined from a rating curve well defined between 20 and 80 second-feet. Discharge Dec. 9, 1910, to Sept. 30, 1911, determined from a rating curve fairly well defined between 24 and 100 second-feet. Discharge Nov. 10 to 20, 1910, determined from hydrograph comparison with records at adjacent stations. Discharge interpolated for days when no gage height was reported.

Monthly discharge of Salmon River near Rowe, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	40	15	19.2	1,180	A.
November	69	15	38.1	2,270	B.
December	102	44	64.7	3,980	B.
January	47	24	33.2	2,040	B.
February	27	20	22.5	1,250	B.
March	35	18	22.2	1,360	B.
April	54	24	34.2	2,040	B.
May	64	47	54.1	3,330	B.
June	65	39	51.5	3,060	C.
July	40	22	30.3	1,860	B.
August	24	19	21.1	1,300	B.
September	38	18	24.4	1,450	B.
The year	102	15	34.7	25,100	

BULL RUN RIVER NEAR BULL RUN, OREG.

Location.—In sec. 25, T. 1 S., R. 5 E., 1¼ miles above intake of Portland water-supply pipe line and 5 miles east of Bull Run.

Records available.—August 20, 1907, to September 30, 1911.

Drainage area.—102 square miles (revised value, based on measurement on Mount Hood topographic sheet).

Gage.—Friez automatic referred to vertical staff. Prior to July 28, 1909, an inclined staff at headworks 1¼ miles below present gage.

Channel.—Rocks and gravel; shifting in extreme floods.

Discharge measurements.—Made from cable at gage or by wading near gage.

Accuracy.—Results good.

Cooperation.—Gage-height record furnished by city of Portland, which maintains equipment.

Discharge measurements of Bull Run River near Bull Run, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 20	E. S. Fuller	5.20	1,350
July 18	W. O. Harmon	2.98	149
Sept. 19	R. W. Davenport	3.58	334

Daily gage height, in feet, of Bull Run River near Bull Run, Oreg., for the year ending Sept. 30, 1911.

Staff gage at headworks.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.25	0.75	2.90	2.3	3.0	1.0	2.9	2.1	2.65	1.6	1.45	1.6
2	.88	.80	3.80	2.0	2.65	1.0	2.75	3.0	2.6	1.5	2.05	1.9
3	3.66	1.55	4.00	1.9	2.35	1.0	2.4	3.3	2.15	1.55	2.05	2.0
4	3.18	1.30	3.90	1.9	2.1	1.1	2.1	3.6	1.8	1.5	2.05	2.1
5	2.70	1.10	3.50	2.0	2.0	1.1	1.9	3.4	1.75	1.4	2.05	2.7
6	2.00	1.20	3.00	2.1	1.9	1.25	1.8	3.5	1.75	1.25	2.05	2.75
7	1.85	4.22	3.60	3.5	1.7	1.35	1.5	2.75	1.75	1.25	2.05	1.95
8	1.50	4.10	4.60	2.8	1.55	1.65	1.4	2.8	1.7	1.2	2.05	1.8
9	1.30	4.72	3.60	2.9	1.55	2.0	1.8	2.9	1.65	1.1	2.05	2.2
10	1.20	5.28	3.00	2.4	1.55	1.9	2.2	2.9	1.65	1.05	2.05	2.0
11	1.00	5.30	2.50	2.2	1.65	2.4	1.85	2.6	1.85	1.0	2.05	1.9
12	1.20	4.30	2.20	2.0	1.6	2.1	1.7	3.1	1.8	.9	2.05	1.75
13	.90	2.90	2.00	1.9	1.8	2.0	1.55	3.0	1.8	1.3	2.0	1.9
14	.80	2.45	1.90	1.8	1.7	2.0	1.5	2.8	1.7	1.2	2.0	1.9
15	.70	2.05	1.80	1.5	1.6	2.2	1.5	2.75	1.6	1.1	2.0	3.0
16	.65	1.85	1.70	1.4	1.5	2.4	1.8	2.7	1.5	1.05	1.95	3.05
17	3.46	1.70	1.60	1.5	1.55	2.4	1.8	3.2	1.4	1.2	1.9	3.0
18	2.70	1.90	1.50	5.0	1.8	2.3	2.5	5.0	1.3	2.0	1.85	2.9
19	2.00	2.30	1.30	6.1	1.75	2.35	2.3	4.1	1.25	2.0	1.8	2.6
20	1.70	5.32	1.30	4.2	1.7	2.6	2.15	3.4	1.3	2.0	2.1	2.4
21	1.45	5.50	1.25	2.7	1.6	2.7	2.2	3.3	1.3	2.0	2.0	2.2
22	1.30	4.70	1.20	2.5	1.5	2.75	2.2	3.0	1.7	2.0	1.8	2.0
23	1.25	4.60	2.55	2.8	1.45	3.25	2.2	2.7	1.45	1.9	1.65	2.0
24	1.35	3.50	3.50	2.5	1.4	2.9	2.6	2.5	1.5	1.8	1.6	1.9
25	1.50	2.90	3.10	2.0	1.35	3.2	2.8	2.55	1.45	1.7	1.5	1.85
26	1.25	2.60	2.70	1.75	1.25	2.7	2.5	2.55	1.5	1.6	1.45	1.85
27	1.10	2.40	2.60	1.6	1.1	2.3	2.3	2.45	1.7	1.6	1.45	1.7
28	1.00	2.50	2.50	1.6	1.1	2.1	2.2	2.4	1.6	1.5	1.3	1.7
29	.95	3.10	2.50	1.55	....	2.5	1.9	2.4	2.0	1.5	1.25	1.7
30	.85	3.40	2.50	2.3	....	3.3	1.9	2.5	1.8	1.5	1.25	1.8
31	.80	....	2.40	2.7	....	2.8	....	2.65	....	1.45	1.2	....

NOTE.—Gage heights affected by changes in a temporary dam at the headworks during the summer. Changes were made in this dam June 22, July 13 and 17, Aug. 2, Sept. 1, and Oct. 12 and 28, 1911.

Daily gage height, in feet, of Bull Run River near Bull Run, Oreg., for the year ending Sept. 30, 1911—Continued.

Friez gage.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	3.04	3.08	4.96	4.18	....	3.31	....	4.17	4.64	3.69	2.90	2.64
2	3.15	3.12	5.80	4.04	....	3.29	4.67	4.87	4.43	3.58	2.90	2.64
3	5.10	3.60	5.65	3.96	....	3.27	4.42	5.15	4.23	3.53	2.89	....
4	5.10	3.45	5.63	3.97	....	3.32	4.20	5.35	4.07	3.49	2.89	....
5	4.55	3.32	5.23	4.09	....	3.36	4.03	5.10	3.99	3.41	2.89	....
6	4.04	3.50	4.99	4.23	....	3.45	3.91	4.88	3.96	3.34	2.89	....
7	3.85	5.35	5.27	5.06	....	3.68	3.81	4.68	3.93	3.33	2.92	....
8	3.62	4.75	5.75	4.78	....	3.80	3.82	4.76	3.87	3.31	2.93	....
9	3.50	6.01	5.20	4.71	....	4.02	3.94	4.84	3.81	3.26	2.88	....
10	3.36	7.10	4.90	4.43	....	4.06	4.11	4.78	3.82	3.20	2.87	3.23
11	3.29	6.17	4.60	4.24	....	4.33	3.94	4.56	3.84	3.16	2.85	3.11
12	3.29	5.29	4.30	4.06	....	4.17	3.83	4.86	3.85	3.14	2.85	3.06
13	3.20	4.78	4.14	3.92	....	4.12	3.72	4.92	3.84	3.10	2.85	3.10
14	3.13	4.40	4.98	3.80	....	4.10	3.67	4.76	3.77	3.07	2.85	3.07
15	3.10	4.15	4.88	3.75	....	4.26	3.72	4.66	3.74	3.05	2.85	4.04
16	3.08	3.96	4.82	3.72	....	4.42	3.89	4.63	3.73	3.04	2.84	4.42
17	4.75	3.82	3.72	3.78	....	4.43	3.89	5.05	3.72	3.03	2.83	4.22
18	4.55	4.03	3.62	....	....	4.41	4.23	6.25	3.70	3.02	2.82	3.84
19	4.08	4.30	3.55	....	3.87	4.44	4.23	6.10	3.65	3.01	2.82	3.62
20	3.80	....	3.52	....	3.79	4.61	4.10	5.30	3.60	3.00	2.86	3.44
21	3.62	....	3.53	....	3.70	4.65	4.17	5.05	3.57	3.00	2.85	3.34
22	3.50	....	3.53	....	3.62	4.69	4.15	4.84	3.55	3.00	2.79	3.27
23	3.42	....	4.70	....	3.56	4.94	4.19	4.56	3.51	2.99	2.76	3.18
24	3.48	....	5.19	....	3.51	4.94	4.44	4.47	3.48	2.97	2.74	3.16
25	3.60	....	4.90	....	3.47	....	4.59	4.51	3.44	2.95	2.72	3.11
26	3.47	4.47	4.63	....	3.41	....	4.37	4.49	3.59	2.93	2.70	3.09
27	3.35	4.37	4.57	....	3.36	....	4.22	4.46	3.78	2.92	2.70	3.07
28	3.30	4.56	4.46	....	3.33	....	4.02	4.47	3.75	2.91	2.69	3.04
29	3.25	5.13	4.46	....	....	....	3.94	4.53	3.98	2.90	2.67	3.00
30	3.18	5.20	4.58	....	....	....	4.03	4.60	3.80	2.90	2.66	3.00
31	3.12	....	4.34	....	....	....	....	4.70	....	2.90	2.66	....

Daily discharge, in second-feet, of Bull Run River near Bull Run, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	171	182	1,200	628	1,120	253	1,050	622	942	396	135	80
2	203	194	2,120	550	896	247	966	1,130	791	352	135	80
3	1,340	360	1,940	510	728	240	784	1,390	658	332	133	91
4	1,340	302	1,920	515	622	257	640	1,600	565	316	133	106
5	875	257	1,470	575	580	270	545	1,340	525	288	133	404
6	550	320	1,230	658	545	302	485	1,130	510	264	133	404
7	460	1,600	1,520	1,290	476	392	444	974	495	260	140	191
8	368	1,030	2,060	1,050	432	440	448	1,040	468	253	142	163
9	320	2,370	1,440	998	432	540	500	1,100	444	237	130	247
10	270	3,820	1,150	791	432	555	586	1,050	448	218	128	228
11	247	2,570	910	664	464	721	500	882	456	206	124	191
12	247	1,540	700	560	448	622	452	1,120	460	200	124	177
13	218	1,050	604	490	510	592	408	1,170	456	188	124	188
14	197	770	1,220	440	476	580	388	1,040	428	180	124	180
15	188	610	1,130	420	448	676	408	958	416	174	124	550
16	182	510	1,090	408	420	784	476	934	412	171	121	784
17	1,030	448	408	432	432	791	476	1,290	408	168	119	652
18	875	545	368	3,330	510	777	658	2,680	400	166	117	456
19	570	700	340	5,080	468	798	658	2,480	380	163	117	368
20	440	3,800	328	2,240	436	918	580	1,550	360	160	126	298
21	368	4,100	332	926	400	950	622	1,290	348	160	124	264
22	320	2,890	332	812	368	982	610	1,100	340	160	110	240
23	291	2,750	990	707	344	1,190	634	882	324	158	104	212
24	313	1,510	1,440	812	324	1,190	833	819	313	152	99	206
25	360	1,050	1,150	580	309	1,240	903	847	298	148	95	191
26	309	819	934	490	288	926	749	833	356	142	91	185
27	267	749	889	448	270	707	652	812	432	140	91	180
28	250	882	812	448	260	622	540	819	420	138	89	171
29	234	1,370	812	432	....	812	500	861	520	135	85	160
30	212	1,440	896	707	....	1,340	545	910	440	135	83	160
31	194	....	728	926	....	990	....	990	....	135	83	....

NOTE.—Discharge determined from a rating curve well defined between 70 and 2,500 second-feet. Discharge for periods when automatic gage was not registering determined from gage heights from the staff gage at the headworks, and a curve showing the relation between the readings of the staff gage at the headworks and the automatic gage.

Monthly discharge of Bull Run River near Bull Run, Oreg., for the year ending Sept. 30, 1911.

[Drainage area, 102 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	1,340	171	426	4.18	4.82	26,200	A.
November	4,100	182	1,350	13.2	14.73	80,300	B.
December	2,120	328	1,050	10.3	11.87	64,600	A.
January	5,080	408	933	9.15	10.55	57,400	B.
February	1,120	260	480	4.71	4.90	26,700	A.
March	1,340	240	700	6.86	7.91	43,000	A.
April	1,050	388	601	5.89	6.57	35,800	A.
May	2,680	622	1,150	11.3	13.03	70,700	A.
June	942	298	460	4.51	5.03	27,400	A.
July	396	135	203	1.99	2.29	12,500	A.
August	142	83	117	1.15	1.33	7,190	A.
September	784	80	260	2.55	2.84	15,500	A.
The year	5,080	80	645	6.32	85.87	467,000	

LITTLE SANDY RIVER NEAR BULL RUN, OREG.

Location.—In sec. 10, T. 2 S., R. 5 E., half a mile below the tunnel from Big Sandy River, about 1½ miles above the mouth, and about 3 miles east of Bull Run.

Records available.—May 23 to July 25, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Rocks and gravel; may shift slightly.

Discharge measurements.—Made by wading near gage or from cable three-eighths mile above gage.

Cooperation.—Gage-height record furnished by the Mount Hood Railway & Power Co.

Estimates withheld for additional data.

Discharge measurements of Little Sandy River near Bull Run, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
July 19	W. O. Harmon	a 2.20	20.7
Sept. 19	R. W. Davenport	2.57	82.1

a Observer's gage reading for the day.

Daily gage height, in feet, of Little Sandy River near Bull Run, Oreg., for the year ending Sept. 30, 1911.

Day.	May.	June.	July.	Day.	May.	June.	July.	Day.	May.	June.	July.
1		3.20	2.20	11		2.60	2.20	21		2.80	2.20
2		3.00	2.20	12		2.60	2.20	22		2.25	2.20
3		2.85	2.20	13		2.55	2.20	23	3.10	2.25	2.17
4		2.70	2.20	14		2.50	2.20	24	3.10	2.20	2.25
5		2.70	2.20	15		2.45	2.20	25	3.00	2.20	2.20
6		2.70	2.20	16		2.45	2.17	26	3.05	2.20	
7		2.65	2.20	17		2.40	2.20	27	3.05	2.25	
8		2.65	2.20	18		2.40	2.20	28	3.00	2.30	
9		2.60	2.20	19		2.30	2.20	29	3.10	2.30	
10		2.60	2.20	20		2.30	2.20	30	3.20	2.25	
								31	3.20	2.20	

MIDDLE FORK OF WILLAMETTE RIVER NEAR HAZELDELL, OREG.

Location.—In sec. 12, T. 21 S., R. 2 E., just below the North Fork of Willamette River, and about 4 miles below Hazeldell.

Records available.—March 22 to September 30, 1911; fragmentary.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Gravel and bowlders; practically permanent.

Discharge measurements.—Made from cable near gage.

Regulation.—A temporary dam has been constructed at the present outlet of Waldo Lake, and during the low water of 1909 a considerable amount of stored water was released. No storage operations since 1909.

Accuracy.—Results fair.

Discharge measurements of Middle Fork of Willamette River near Hazeldell, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 16	B. F. Heintzleman	2.99	3,070
Aug. 25	.....do	1.48	843

Daily gage height, in feet, of Middle Fork of Willamette River near Hazeldell, Oreg., for the year ending Sept. 30, 1911.

[G. J. Landess, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1		3.6	2.6	3.3	2.20	1.40	
2		3.5	2.6	3.3	2.10		1.44
3		3.2	2.8	3.2	2.00		
4		3.1	2.8	3.0	2.00		
5		2.9	3.0	2.8		1.40	2.20
6		2.7	2.9	2.8	2.00		1.95
7		2.6	2.8				1.80
8			2.9	2.8	1.90	1.40	1.47
9		2.7	2.8	2.7	1.85		1.75
10		2.7	2.8	2.7	1.80	1.40	
11		2.6	2.8	2.9		1.35	1.40
12		2.6	2.8	3.1	1.75		
13		2.5			1.75		
14		2.40		2.9		1.30	
15		2.45	2.8		1.65		
16		2.6	3.0	2.7	1.65		
17		2.5	3.1	2.6	1.60		
18		2.6	3.9	2.5	1.60		1.40
19		2.6	3.9	2.40			
20		2.6	3.6				
21		2.6	3.5				1.30
22	3.1	2.7		2.30	1.50		1.30
23	3.1	2.8		2.20		1.30	
24	3.4	2.9					
25	3.4	3.2	3.0	2.15	1.50		
26	3.3	3.2	2.8	2.15			
27	2.8	3.0	2.8	2.5			1.70
28	2.7	2.8			1.40		
29	2.8			2.30			
30	3.0						
31	3.4		3.0				

Daily discharge, in second-feet, of Middle Fork of Willamette River near Hazeldell, Oreg., for the year ending Sept. 30, 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1		4,340	2,400	3,700	1,770	760	660
2		4,100	2,400	3,700	1,620	760	804
3		3,500	2,740	3,500	1,480	760	804
4		3,300	2,740	3,100	1,480	760	804
5		2,920	3,100	2,740	1,480	760	1,770
6		2,570	2,920	2,740	1,480	760	1,420
7		2,400	2,740	2,740	1,420	760	1,220
8		2,480	2,920	2,740	1,350	760	837
9		2,570	2,740	2,570	1,280	760	1,160
10		2,570	2,740	2,570	1,220	760	960
11		2,400	2,740	2,920	1,190	710	760
12		2,400	2,740	3,300	1,160	690	760
13		2,240	2,800	3,150	1,160	680	760
14		2,080	2,800	2,920	1,100	660	760
15		2,160	2,740	2,740	1,040	660	760
16		2,400	3,100	2,570	1,040	660	760
17		2,240	3,300	2,400	980	660	760
18		2,400	5,060	2,240	980	660	760
19		2,400	5,060	2,080	950	660	710
20		2,400	4,340	2,030	920	660	710
21	....	2,400	4,100	1,970	900	660	660
22	3,300	2,570	3,850	1,920	870	660	660
23	3,300	2,740	3,600	1,770	870	660	660
24	3,900	2,920	3,350	1,740	870	660	660
25	3,900	3,500	3,100	1,700	870	660	760
26	3,700	3,500	2,740	1,700	840	660	900
27	2,740	3,100	2,740	2,240	790	660	1,100
28	2,570	2,740	2,700	2,080	760	660	1,020
29	2,740	2,630	2,700	1,920	760	660	940
30	3,100	2,510	2,900	1,840	760	660	860
31	3,900	....	3,100	....	760	660	....

NOTE.—Discharge determined from a fairly well defined rating curve. Discharge for days when no gage height was reported estimated by comparison with records on Middle Fork of Willamette River at Jasper.

Monthly discharge of Middle Fork of Willamette River near Hazeldell, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
March 22-31	3,900	2,570	3,320	65,800	B.
April	4,340	2,080	2,750	164,000	B.
May	5,060	2,400	3,130	192,000	B.
June	3,700	1,700	2,510	149,000	B.
July	1,770	760	1,100	67,600	B.
August	760	660	695	42,700	B.
September	1,770	660	872	51,900	B.
The period	....	....	....	733,000	

MIDDLE FORK OF WILLAMETTE RIVER AT JASPER, OREG.

Location.—In sec. 23, T. 18 S., R. 2 W., just below Jasper post office, 2 miles above Natron and 3 miles below Fall Creek.

Records available.—September 16, 1905, to September 30, 1911.

Drainage area.—1,450 square miles.

Gage.—Vertical staff on right bank.

Channel.—Gravel and small bowlders; shifting.

Discharge measurements.—Made from boat or temporary footbridge near gage.

Regulation.—Some storage developed on Waldo Lake, but no storage operations since 1909.

Accuracy.—Results good.

Discharge measurements of Middle Fork of Willamette River at Jasper, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 7	B. F. Heintzleman.....	3.20	968	Aug. 30	R. C. Pierce............	2.88	680

Daily gage height, in feet, of Middle Fork of Willamette River at Jasper, Oreg., for the year ending Sept. 30, 1911.

[Philip Sylvester, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.9	2.9	6.7	4.8	5.3	3.9	5.2	4.3	5.0	4.5	3.0	2.9
2	3.0	2.9	6.0	4.6	5.6	3.9	5.1	4.3	5.3	3.8	3.0	2.9
3	3.1	2.9	6.8	4.5	5.3	3.9	4.9	4.4	5.2	3.7	3.0	3.0
4	4.3	2.9	7.8	4.4	5.2	3.9	4.8	4.5	5.0	3.7	3.0	3.1
5	3.6	2.9	6.7	4.4	5.2	4.1	4.8	4.6	4.9	3.7	3.0	3.8
6	3.4	2.9	6.0	4.4	4.9	4.3	4.6	4.7	4.8	3.6	3.0	4.3
7	3.2	3.0	5.6	4.4	4.8	4.5	4.4	4.5	4.9	3.6	3.0	3.6
8	3.1	5.0	5.3	4.3	4.6	4.5	4.3	4.6	5.0	3.5	3.0	3.3
9	3.1	4.8	6.4	4.4	4.5	4.5	4.3	4.7	4.4	3.5	3.0	3.3
10	3.0	4.6	5.9	4.6	4.4	4.4	4.4	4.7	4.3	3.5	3.0	3.3
11	3.0	4.7	5.5	4.5	4.7	4.4	4.5	4.6	4.5	3.4	3.0	3.3
12	3.1	4.4	5.3	4.4	4.5	4.4	4.4	4.6	4.6	3.4	3.0	3.2
13	3.2	4.0	5.0	4.3	4.9	4.4	4.4	4.9	4.6	3.3	3.0	3.3
14	3.1	3.7	4.8	4.2	4.7	4.3	4.3	4.9	4.5	3.3	3.0	3.3
15	3.0	3.7	4.7	4.1	4.6	4.5	4.3	4.7	4.5	3.3	3.0	3.4
16	3.0	3.5	4.5	4.1	4.4	4.6	4.5	4.7	4.4	3.3	3.0	3.4
17	3.0	3.4	5.6	4.0	4.4	4.7	4.5	5.0	4.3	3.3	2.9	3.3
18	3.3	3.5	5.2	4.8	4.7	4.7	4.5	6.0	4.2	3.2	2.9	3.2
19	3.2	3.8	4.9	7.4	4.6	4.7	4.6	6.7	4.1	3.2	2.9	3.1
20	3.1	3.9	4.8	6.6	4.5	4.8	4.5	6.0	4.0	3.2	2.9	3.0
21	3.0	3.9	4.5	5.7	4.4	4.9	4.5	5.6	3.9	3.2	2.9	3.1
22	3.0	4.5	4.4	5.2	4.3	4.9	4.5	5.5	3.9	3.1	2.9	3.1
23	3.0	5.4	4.3	4.9	4.2	5.1	4.5	5.4	3.8	3.1	2.9	3.1
24	3.0	8.1	4.8	4.7	4.1	5.2	4.6	5.2	3.8	3.1	2.9	3.0
25	3.0	6.4	4.8	4.6	4.1	5.3	4.8	4.9	3.8	3.1	2.9	3.0
26	3.0	5.4	4.6	4.5	4.0	4.9	4.8	4.8	3.7	3.1	2.9	3.3
27	3.0	4.4	4.7	4.4	3.9	4.6	4.7	4.6	4.1	3.0	2.9	3.8
28	3.0	9.6	4.6	4.5	3.9	4.5	4.5	4.4	4.2	3.0	2.9	3.5
29	2.9	11.3	4.5	4.5	......	4.5	4.4	4.4	4.3	3.0	2.9	3.4
30	2.9	8.4	4.6	4.5	......	4.6	4.3	4.6	4.5	3.0	2.9	3.3
31	2.9	......	4.8	5.2	......	4.8	......	4.7	......	3.0	2.9	......

NOTE.—Gage heights June 1 to 3, 1911, affected by backwater from logs on the control.

Daily discharge, in second-feet, of Middle Fork of Willamette River at Jasper, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	670	670	10,900	3,880	5,250	1,960	4,950	2,730	3,820	3,160	760	670
2	760	670	7,800	3,390	6,250	1,960	4,670	2,730	4,010	1,790	760	670
3	860	670	11,400	3,160	5,250	1,960	4,100	2,910	4,200	1,630	760	760
4	2,730	670	17,000	2,940	4,950	1,960	3,880	3,160	4,400	1,630	760	860
5	1,480	670	10,900	2,940	4,950	2,330	3,880	3,390	4,140	1,630	760	1,790
6	1,210	670	7,800	2,940	4,140	2,730	3,390	3,630	3,880	1,480	760	2,730
7	970	760	6,250	2,940	3,880	3,160	2,940	3,160	4,140	1,480	760	1,480
8	860	4,400	5,250	2,730	3,390	3,160	2,730	3,390	4,400	1.340	760	1,090
9	860	3,880	9,520	2,940	3,160	3,160	2.730	3,630	2.940	1,340	760	1,090
10	760	3,390	7,390	3,390	2,940	2,940	2.940	3,630	2,730	1,340	760	1,090
11	760	3,630	5,900	3,160	3,630	2,940	3,160	3,390	3,160	1,210	760	1,090
12	860	2,940	5,250	2,940	3.160	2,940	2,940	3,390	3,390	1,210	760	970
13	970	2,140	4,400	2,730	4,140	2,940	2,940	4,140	3,390	1,090	760	1,090
14	860	1,630	3,880	2,530	3,630	2.730	2,730	4,140	3,160	1.090	760	1,090
15	760	1,630	3,630	2,330	3,390	3,160	2,730	3,630	3,160	1,090	760	1,210
16	760	1,340	3,160	2,330	2,940	3,390	3,160	3,630	2,940	1,090	760	1,210
17	760	1,210	6,250	2,140	2,940	3,630	3,160	4,400	2,730	1,090	670	1,090
18	1,090	1,340	4,950	3.880	3,630	3,630	3,160	7,800	2,530	970	670	970
19	970	1,790	4,140	14,600	3,390	3,630	3,390	10,900	2,330	970	670	860
20	860	1,960	3,880	10,400	3,160	3,880	3,160	7,800	2,140	970	670	760
21	760	1,960	3,160	6,610	2,940	4,140	3,160	6,250	1,960	970	670	860
22	760	3,160	2,940	4,950	2,730	4,140	3,160	5,900	1,960	860	670	860
23	760	5.570	2,730	4,140	2,530	4,670	3,160	5,570	1,790	860	670	860
24	760	18.900	3,880	3,630	2,330	4.950	3.390	4,950	1,790	860	670	760
25	760	9,520	3,880	3,390	2,330	5,250	3,880	4,140	1,790	860	670	760
26	760	5,570	3,390	3,160	2,140	4,140	3,880	3,880	1,630	860	670	1,090
27	760	2,940	3,630	2,940	1,960	3,390	3,630	3,390	2,330	760	670	1,790
28	760	31,900	3,390	3,160	1,960	3,160	3.160	2,940	2,530	760	670	1,340
29	670	51,100	3.160	3,160	....	3,160	2,940	2,940	2,730	760	670	1,210
30	670	21,100	3,390	3,160	....	3,390	2,730	3,390	3,160	760	670	1,090
31	670	....	3,880	4,950	....	3,880	....	3,630	....	760	670	....

NOTE.—Discharge determined from a rating curve well defined between 700 and 10,000 second-feet, and fairly well defined above 10,000 second-feet. Discharge June 1 to 3, 1911, interpolated.

Monthly discharge of Middle Fork of Willamette River at Jasper, Oreg., for the year ending Sept. 30, 1911.

[Drainage area, 1,450 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	2,730	670	2,350	1.62	1.87	144,000	A.
November	51,100	670	6,260	4.32	4.82	372,000	B.
December	17,000	2,730	5,710	3.94	4.54	351,000	B.
January	14,600	2,140	3,920	2.70	3.11	241,000	A.
February	6,250	1,960	3,470	2.39	2.49	193,000	A.
March	5,250	1,960	3,310	2.28	2.63	204,000	A.
April	4,950	2,730	3,330	2.30	2.57	198,000	A.
May	10,900	2,730	4,280	2.95	3.40	263,000	A.
June	4,400	1,630	2,980	2.06	2.30	177,000	A.
July	3,160	760	1,180	.814	.94	72,600	A.
August	760	670	716	.494	.57	44,000	A.
September	2,730	670	1,110	.766	.85	66,000	A.
The year	51,100	670	3,210	2.21	30.09	2,330,000	

WILLAMETTE RIVER AT ALBANY, OREG.

Location.—In sec. 6, T. 11 S., R. 3 W., at the end of Broadalbin Street, about half a mile above the railroad bridge, just below the mouth of Calapooia Creek and 7 miles above Santiam River.

Records available.—1879 and 1894 to September 30, 1911, with some fragmentary records 1880 to 1893.

Drainage area.—4,860 square miles.

Gage.—Vertical staff in two sections.

Channel.—Sand and fine gravel; control practically permanent. Above gage height 17 feet water begins to flow through a slough several hundred feet to the left of the main channel.

Discharge measurements.—Made from Corvallis and Eastern Railroad bridge.

Accuracy.—Results good.

Cooperation.—Gage-height record furnished by United States Weather Bureau.

No discharge measurements made during the year.

Daily gage height, in feet, of Willamette River at Albany, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.7	0.8	18.8	5.8	7.3	3.4	4.0	3.3	4.0	2.6	1.0	0.6
2	.7	.7	13.4	5.6	7.5	3.3	4.6	3.3	4.3	2.5	1.0	.6
3	.8	.8	10.8	5.2	8.1	3.2	4.7	3.4	4.4	2.3	1.0	.5
4	1.0	.8	12.7	4.8	7.4	3.1	4.5	3.7	4.2	2.3	1.0	.5
5	2.3	.8	14.6	4.7	6.8	3.2	4.4	3.9	4.0	2.2	1.0	.5
6	2.1	.8	12.3	4.6	6.9	3.6	4.1	4.2	3.7	2.1	1.0	.9
7	1.7	1.0	10.1	4.4	6.8	4.0	3.8	4.4	3.6	2.0	1.0	.5
8	1.4	1.3	8.6	4.2	6.3	4.2	3.6	4.1	3.4	2.0	1.0	3.0
9	1.2	4.7	7.9	4.3	5.7	4.4	3.4	4.1	3.5	1.9	1.0	1.7
10	1.1	4.7	9.2	6.1	5.5	4.3	3.5	4.3	3.4	2.0	1.0	1.4
11	1.0	4.6	8.2	6.0	5.3	4.2	4.0	4.4	3.3	1.7	1.0	1.6
12	1.0	5.0	7.3	6.3	5.2	4.2	4.5	4.2	8.2	1.7	.9	1.4
13	1.0	4.2	6.6	6.0	6.3	4.1	4.6	4.1	3.5	1.6	.9	1.3
14	1.0	3.4	6.0	5.4	7.1	4.0	4.6	4.6	3.5	1.6	.9	1.3
15	1.1	2.9	5.5	4.7	6.8	4.0	4.5	4.6	3.4	1.6	.9	1.2
16	1.1	2.5	5.1	4.4	6.2	4.2	4.2	4.4	3.3	1.5	.9	1.2
17	1.0	2.2	5.2	4.5	5.6	4.4	4.3	4.2	3.2	1.5	.8	1.5
18	1.0	2.1	7.5	10.3	5.3	4.5	4.3	4.7	3.1	1.5	.8	1.5
19	1.0	2.2	7.0	18.0	5.1	4.4	4.3	7.0	2.9	1.4	.8	1.5
20	1.0	2.7	6.2	19.4	5.3	4.3	4.4	8.9	2.7	1.4	.8	1.2
21	1.0	3.0	5.6	18.2	5.1	4.6	4.3	7.8	2.6	1.3	.7	1.1
22	1.0	4.8	5.2	12.2	4.8	4.7	4.1	6.8	2.5	1.3	.7	1.1
23	1.0	7.2	4.8	9.6	4.5	4.7	4.1	6.2	2.4	1.2	.7	1.0
24	.9	10.9	4.6	8.0	4.2	5.0	4.1	5.8	2.3	1.2	.7	.9
25	.9	9.5	5.1	7.2	4.0	5.2	4.1	5.4	2.3	1.2	.7	.9
26	.9	7.2	5.2	7.3	3.8	5.0	4.4	4.9	2.2	1.2	.7	1.0
27	.9	5.9	5.0	7.1	3.8	4.6	4.3	4.6	2.3	1.1	.7	1.2
28	.8	6.0	5.0	7.0	3.6	4.3	4.1	4.3	2.4	1.1	.6	2.1
29	.8	12.3	4.8	6.7	....	3.9	3.8	4.1	2.6	1.1	.6	1.8
30	.8	17.6	4.8	6.3	....	3.8	3.5	4.0	2.4	1.0	.6	1.6
31	.8	....	5.4	6.4	....	4.0	....	4.0	....	1.0	.6	....

Daily discharge, in second-feet, of Willamette River at Albany, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2,760	2,960	74,100	15,900	20,700	8,950	10,600	8,690	10,600	6,930	3,330	2,580
2	2,760	2,760	45,600	15,300	21,400	8,690	12,300	8,690	11,500	6,690	3,330	2,580
3	2,950	2,950	33,900	14,100	23,500	8,430	12,600	8,950	11,800	6,210	3,330	2,400
4	3,330	2,960	42,300	12,900	21,100	8,170	12,000	9,760	11,200	6,210	3,330	2,400
5	6,210	2,960	51,500	12,600	19,100	8,430	11,800	10,300	10,600	5,970	3,330	2,400
6	5,730	2,960	40,500	12,300	19,400	9,490	10,900	11,200	9,760	5,730	3,330	3,140
7	4,810	3,330	30,900	11,800	19,100	10,600	10,000	11,800	9,490	5,500	3,330	2,400
8	4,150	3,940	25,300	11,200	17,500	11,200	9,490	10,900	8,960	5,500	3,330	7,920
9	3,730	12,600	22,800	11,500	15,600	11,800	8,950	10,900	9,220	5,270	3,330	4,810
10	3,530	12,600	27,500	16,800	15,000	11,500	9,220	11,500	8,960	5,500	3,330	4,150
11	3,330	12,300	23,800	16,500	14,400	11,200	10,600	11,800	8,690	4,810	3,330	4,580
12	3,330	13,500	20,700	17,500	14,100	11,200	12,000	11,200	8,430	4,810	3,140	4,150
13	3,330	11,200	18,400	16,500	17,500	10,900	12,300	10,900	9,220	4,580	3,140	3,940
14	3,330	8,960	16,500	14,700	20,000	10,600	12,300	12,300	9,220	4,580	3,140	3,940
15	3,530	7,670	15,000	12,600	19,100	10,600	12,000	12,300	8,950	4,580	3,140	3,730
16	3,530	6,690	13,800	11,800	17,100	11,200	11,200	11,800	8,690	4,360	3,140	3,730
17	3,330	5,970	14,100	12,000	15,300	11,800	11,500	11,200	8,430	4,360	2,950	4,360
18	3,330	5,730	21,400	31,800	14,400	12,000	11,500	12,600	8,170	4,360	2,950	4,360
19	3,330	5,970	19,700	69,300	13,800	11,800	11,500	19,700	7,670	4,150	2,950	4,360
20	3,330	7,170	17,100	78,000	14,400	11,500	11,800	26,300	7,170	4,150	2,950	3,730
21	3,330	7,920	15,300	70,500	13,800	12,300	11,500	22,400	6,930	3,940	2,760	3,530
22	3,830	12,900	14,100	40,000	12,900	12,600	10,900	19,100	6,690	3,940	2,760	3,530
23	3,330	20,400	12,900	29,000	12,000	12,600	10,900	17,100	6,450	3,730	2,760	3,330
24	3,140	34,300	12,300	23,100	11,200	13,500	10,900	15,900	6,210	3,730	2,760	3,140
25	3,140	28,600	13,800	20,400	10,600	14,100	10,900	14,700	6,210	3,730	2,760	3,140
26	3,140	20,400	14,100	20,700	10,000	13,500	11,800	13,200	5,970	3,730	2,760	3,330
27	3,140	16,200	13,500	20,000	10,000	12,300	11,500	12,300	6,210	3,530	2,760	3,730
28	2,950	16,500	13,500	19,700	9,490	11,500	10,900	11,500	6,450	3,530	2,580	5,730
29	2,950	40,500	12,900	18,700	....	10,300	10,000	10,900	6,930	3,530	2,580	5,040
30	2,950	67,100	12,900	17,500	....	10,000	9,220	10,600	6,450	3,330	2,580	4,580
31	2,950	....	14,700	17,800	....	10,600	....	10,600	....	3,330	2,580	....

NOTE.—Discharge determined from a rating curve fairly well defined below 200,000 second-feet. Discharge figures for Oct. 1 to Dec. 31, 1910, supersede those published in Water Supply Paper 292, p. 547.

Monthly discharge of Willamette River at Albany, Oreg., for the year ending Sept. 30, 1911.

[Drainage area, 4,860 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	6,210	2,760	3,480	0.716	0.83	214,000	A.
November	67,100	2,760	13,300	2.74	3.06	791,000	A.
December	74,100	12,300	23,400	4.81	5.54	1,440,000	A.
January	78,000	11,200	23,000	4.73	5.45	1,410,000	B.
February	23,500	9,490	15,800	3.25	3.38	878,000	B.
March	14,100	8,170	11,100	2.28	2.63	682,000	B.
April	12,600	8,950	11,100	2.28	2.54	660,000	B.
May	26,300	8,690	12,900	2.65	3.06	793,000	B.
June	11,800	5,970	8,370	1.72	1.92	498,000	B.
July	6,930	3,330	4,650	.957	1.10	286,000	B.
August	3,330	2,580	3,020	.621	.72	186,000	B.
September	7,920	2,400	3,820	.786	.88	227,000	B.
The year	82,400	2,400	11,100	2.28	31.11	8,060,000	

WILLAMETTE RIVER AT SALEM, OREG.

Location.—At the dock of the Oregon-Washington Railroad & Navigation Co. at Salem, below Santiam and Luckiamute rivers and above Molalla, Tualatin, and Clackamas rivers.

Records available.—January 1, 1892, to September 30, 1911. Records continuous through the summer low-water periods only since 1904.

Drainage area.—Not measured.

Gage.—Vertical staff in four sections.

Channel.—Gravel and sand; practically permanent.

Discharge measurements.—Made from highway bridge about half a mile below the gage.

Estimates withheld for additional data.

Discharge measurements of Willamette River at Salem, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 14	F. C. Ebert	0.15	5,720	May 20	Charles Leidl	8.35	54,600
				22	do	6.30	35,300

Daily gage height, in feet, of Willamette River at Salem, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	−0.7	−0.4	15.5	5.0	6.4	2.8	4.3	2.9	3.6	1.8	−0.1	−0.7
2	− .7	− .4	13.5	4.9	7.0	2.7	4.5	2.9	3.8	1.8	− .1	− .7
3	− .4	− .5	10.8	4.5	7.0	2.5	4.4	3.1	3.8	1.7	− .1	− .7
4	+ .7	− .5	12.7	4.3	6.5	2.4	4.1	3.5	3.6	1.5	− .1	− .5
5	1.9	− .5	13.5	4.0	5.9	2.5	3.9	3.9	3.3	1.3	− .1	− .2
6	2.1	− .3	12.2	3.9	6.0	2.9	3.5	4.2	3.1	1.2	− .1	+ .3
7	1.5	− .1	9.8	3.8	5.8	3.2	3.2	4.1	2.9	1.1	− .1	1.8
8	.9	+2.6	8.5	3.7	5.5	3.5	3.0	3.9	2.8	1.1	− .2	1.5
9	.5	5.2	8.3	3.7	5.1	3.7	2.9	3.8	2.7	1.0	− .2	.9
10	.3	6.0	8.6	4.5	4.7	3.8	2.9	3.9	2.7	.9	− .3	.5
11	.2	6.9	7.8	5.1	4.8	3.7	3.4	3.9	2.6	.8	− .4	.7
12	.1	6.5	6.8	5.9	5.1	3.7	3.8	3.8	2.7	.7	− .4	.5
13	.1	5.0	6.1	5.2	5.4	3.8	3.8	3.8	2.8	.7	− .4	.4
14	.0	3.9	5.5	4.5	6.0	3.6	3.7	4.2	2.8	.6	− .5	.2
15	.1	3.1	4.9	4.2	5.9	3.6	3.5	4.1	2.7	.6	− .5	.2
16	.1	2.6	4.5	3.7	5.4	3.9	3.4	3.9	2.6	.5	− .5	.1
17	− .1	2.3	4.5	3.7	4.8	4.1	3.6	3.8	2.4	.5	− .5	.7
18	− .1	2.0	5.7	11.6	4.6	4.1	3.7	4.3	2.2	.4	− .5	.8
19	+ .7	2.3	5.8	18.4	4.9	4.0	3.8	7.2	2.1	.3	− .5	.6
20	+ .5	2.5	5.1	19.2	4.7	4.0	4.0	8.5	1.9	.3	− .5	.4
21	+ .3	4.5	4.7	17.5	4.5	4.3	3.8	7.5	1.8	.2	− .6	.2
22	+ .1	8.0	4.3	12.9	4.2	4.4	3.7	6.5	1.7	.2	− .6	.1
23	− .1	9.0	4.0	9.4	3.9	4.4	3.8	5.8	1.6	.1	− .6	.0
24	− .1	11.1	3.9	7.5	3.7	4.7	3.7	5.3	1.5	.1	− .6	− .1
25	− .2	10.2	4.7	6.7	3.4	4.9	3.8	4.9	1.4	.1	− .7	− .1
26	− .2	7.5	4.7	6.6	3.3	4.8	4.0	4.4	1.4	.0	− .7	− .1
27	− .3	5.9	4.5	6.4	3.2	4.3	3.9	4.1	1.4	− .1	− .7	+ .1
28	− .3	6.0	4.4	6.1	2.9	3.9	3.7	3.8	1.7	− .1	− .7	1.2
29	− .4	10.0	4.3	5.8	......	3.5	3.3	3.6	1.8	− .1	− .7	1.1
30	− .4	14.2	4.2	5.5	......	3.4	3.1	3.5	1.7	− .1	− .7	.8
31	− .4	......	4.8	5.7	......	3.7	......	3.5	......	− .1	− .7	......

WILLAMETTE RIVER AT OREGON CITY, OREG.

Location.—At the falls in Willamette River at Oregon City, about half a mile above Clackamas River.

Records available.—August 19, 1883, to September 30, 1911.

Drainage area.—10,200 square miles.

Gage.—Vertical staff on the left bank at the foot of the locks. Readings are also made on a vertical staff gage on the left bank about 1 mile above the falls.

Channel.—Rocky; practically permanent.

Discharge measurements.—Made from a boat at the head of Clackamas Rapids, just above the mouth of Clackamas River, or from the Southern Pacific Railroad bridge, 7 miles below the gage.

Cooperation.—Gage-height records furnished by the Portland Railway, Light & Power Co.

Estimates withheld for additional data.

The following discharge measurement was made by Fuller and Horner:

June 20, 1911: Gage height, 15.2 feet; discharge, 17,200 second-feet.

Daily gage height, in feet, of Willamette River at Oregon City, Oreg., for the year ending Sept. 30, 1911.

[F. C. Miller, jr., observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.0	2.35	19.25	11.0	12.4	7.8	9.2	7.9	10.6	13.8	4.8	2.1
2	2.15	2.4	19.65	10.9	13.1	7.4	9.6	7.8	10.8	13.6	4.6	2.2
3	3.05	2.25	18.55	10.4	13.2	7.4	9.8	8.0	10.8	13.6	4.5	2.0
4	4.2	2.3	18.4	9.9	13.0	7.2	9.4	8.8	10.9	13.4	4.3	2.4
5	5.9	2.3	19.1	9.6	12.2	7.2	8.8	9.5	11.4	13.3	4.2	3.0
6	6.25	2.25	18.8	9.4	12.2	7.5	8.6	9.9	11.6	12.9	4.0	3.4
7	5.9	3.65	17.05	9.2	12.0	8.0	8.2	9.9	11.8	12.6	3.9	4.0
8	4.95	6.1	15.5	9.0	11.6	8.4	7.8	9.8	12.0	12.4	3.9	5.4
9	4.05	9.95	15.15	9.1	11.2	8.8	7.5	9.8	12.0	11.9	3.8	5.0
10	3.9	11.95	15.05	10.0	10.6	9.0	7.6	9.9	12.1	11.8	3.6	4.6
11	3.4	14.15	14.4	11.0	10.6	9.0	8.3	10.0	12.6	11.4	3.5	4.2
12	3.05	13.75	13.45	11.1	10.9	8.8	9.0	9.8	12.8	11.0	3.3	4.2
13	2.9	12.05	12.45	10.9	11.7	9.0	9.0	9.8	13.0	10.4	3.2	3.8
14	2.95	10.3	11.65	10.3	12.8	8.8	8.8	10.0	13.4	10.0	3.0	4.0
15	3.2	8.95	11.0	9.9	12.7	8.8	8.6	10.2	13.8	9.4	2.9	3.7
16	2.9	8.0	10.45	9.2	12.1	9.0	8.3	10.0	14.4	9.1	2.8	3.2
17	3.15	7.45	10.15	9.2	11.4	9.3	8.6	9.8	14.9	8.6	3.0	2.9
18	3.25	6.95	10.7	16.7	11.0	9.4	8.8	10.8	15.0	8.4	2.8	4.5
19	3.15	6.9	11.35	25.9	11.0	9.2	8.9	13.8	15.3	8.0	2.8	4.5
20	4.10	7.25	10.75	27.5	10.9	9.3	9.1	15.3	15.2	7.6	2.6	4.3
21	3.85	11.05	10.1	26.4	10.6	9.4	9.1	15.0	15.0	7.3	2.7	4.3
22	3.25	15.05	9.5	24.7	10.2	9.7	8.8	14.2	15.0	7.0	2.8	3.3
23	3.10	16.75	9.25	18.8	9.7	10.0	8.4	13.4	14.9	7.0	2.8	3.3
24	2.90	17.6	9.5	15.4	9.2	10.0	8.7	12.8	14.8	6.9	2.8	2.5
25	2.90	17.2	10.15	14.2	8.8	10.5	9.0	12.4	14.7	6.5	2.6	2.9
26	2.80	15.0	10.6	13.8	8.5	10.2	9.1	12.1	14.8	6.4	2.6	2.9
27	2.60	13.2	10.3	13.4	8.4	10.0	9.0	11.8	14.7	6.2	2.2	2.8
28	2.45	12.7	10.05	13.0	8.0	9.4	8.8	11.4	14.5	5.7	2.2	2.8
29	2.40	14.5	10.05	12.6	....	8.8	8.4	11.2	14.2	5.4	2.2	4.3
30	2.40	17.8	9.85	12.1	....	8.5	8.0	10.8	14.0	5.0	2.1	4.2
31	2.45	....	10.45	12.0	....	8.6	....	10.6	....	5.1	2.1	....

NORTH FORK OF MIDDLE FORK OF WILLAMETTE RIVER NEAR HAZELDELL, OREG.

Location.—In sec. 12, T. 21 S., R. 2 E., one-fourth mile below a wagon bridge, half a mile above the mouth of North Fork of Middle Fork, and 4 miles west of Hazeldell.

Records available.—October 12, 1909, to September 30, 1911; fragmentary.

Drainage area.—Not measured.

Gage.—Vertical staff on right bank.

Channel.—Gravel and cobblestones; practically permanent.

Discharge measurements.—Made from a cable near the gage or by wading.

Regulation.—Some storage has been developed on Waldo Lake, but there have been no storage operations since 1909.

Estimates withheld for additional data.

Discharge measurements of North Fork of Middle Fork of Willamette River near Hazeldell, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Mar. 22	B. F. Heintzleman	3.21	1,070
Aug. 24	.....do	1.50	178

Daily gage height, in feet, of North Fork of Middle Fork of Willamette River near Hazeldell, Oreg., for the year ending Sept. 30, 1911.

[G. J. Landess, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.3	1.3	4.6	......	2.75	2.0	3.6	2.55	3.1	2.0	1.42	......
2	......	1.3	4.8	......	2.8	2.0	3.5	2.65	3.1	1.95	......	1.4
3	......	1.3	5.2	......	2.65	2.0	3.2	2.8	2.9	......	......	......
4	......	1.3	5.0	......	2.6	2.1	3.1	2.9	2.8	1.85	......	1.4
5	......	1.3	4.8	......	2.6	2.2	2.9	3.0	2.7	1.8	1.4	2.35
6	......	1.3	4.4	......	2.5	2.3	2.8	2.95	2.6	1.8	......	1.8
7	......	1.8	3.6	......	2.45	2.4	2.7	2.8	......	1.8	......	1.5
8	......	2.95	4.0	......	2.4	2.4	2.6	2.9	2.6	......	1.4	1.73
9	......	2.4	3.5	......	2.35	2.4	2.6	2.85	2.5	1.75	......	......
10	......	2.2	3.0	......	2.35	2.4	2.7	2.8	2.5	......	1.4	......
11	......	2.2	......	......	2.35	2.4	2.6	2.7	2.6	1.6	......	......
12	......	2.2	......	......	2.35	2.4	2.6	2.75	2.6	......	......	......
13	......	1.9	......	......	2.4	2.3	2.5	3.0	2.55	1.7	......	......
14	......	1.8	......	......	2.4	2.3	2.5	2.9	2.5	......	1.4	......
15	......	1.75	......	2.2	2.35	2.4	2.5	2.9	2.4	1.65	......	......
16	......	1.7	......	2.2	2.3	2.6	2.5	2.9	2.4	1.63	......	......
17	......	1.6	......	2.2	2.25	2.7	2.5	3.0	......	1.6	......	......
18	......	1.6	......	2.35	2.4	2.9	2.6	3.6	2.2	......	......	1.5
19	......	1.65	......	3.3	2.4	2.9	2.6	3.9	2.15	1.5	......	......
20	......	2.4	......	3.0	2.4	3.0	2.55	3.4	2.1	......	......	......
21	......	3.7	......	2.8	2.3	3.2	2.6	......	2.0	......	1.35	1.42
22	......	3.3	......	2.6	2.2	3.2	2.7	......	2.0	1.5	......	1.42
23	......	5.6	......	2.5	2.2	3.4	2.75	......	2.0	1.5	......	......
24	......	4.15	......	2.4	2.15	3.5	2.9	......	2.0	1.5	1.5	......
25	......	3.4	......	2.4	2.15	3.5	3.2	2.95	1.9	......	......	......
26	......	2.8	......	2.4	2.1	3.2	3.2	2.90	1.9	......	1.3	......
27	......	3.0	......	2.3	2.1	3.0	3.0	2.75	2.0	1.5	1.3	1.8
28	......	6.45	......	2.3	2.05	2.9	2.8	......	2.0	......	......	1.6
29	......	6.85	......	2.3	......	2.9	2.65	......	2.0	......	......	......
30	1.3	5.3	......	2.4	......	3.0	2.55	......	2.05	......	......	1.0
31	1.3	......	......	2.7	......	3.3	......	2.95	......	......	1.3	......

COAST FORK OF WILLAMETTE RIVER NEAR GOSHEN, OREG.

Location.—In sec. 30, T. 18 S., R. 2 W., at the highway bridge 3 miles east of Goshen, 4 miles above the junction of the Coast Fork and Middle Fork, 6 miles west of Jasper, and about 9 miles southeast of Eugene.

Records available.—August 23, 1905, to September 30, 1911.

Drainage area.—690 square miles.

Gage.—Vertical staff in two sections.

Channel.—Gravel and small bowlders; probably shifting during floods.

Discharge measurements.—Made from the highway bridge at the gage or by wading.

Accuracy.—Results fair.

Discharge measurements of Coast Fork of Willamette River near Goshen, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Aug. 4	Henshaw and Davenport	0.24	54.0	Jan. 20	B. F. Heintzleman	7.15	8,300
Oct. 19	B. F. Heintzleman	.50	97.0	Apr. 30	do	1.49	597
				Aug. 28	R. C. Pierce	[a] .60	42.2

[a] Gage height affected by backwater.

Daily gage height, in feet, of Coast Fork of Willamette River near Goshen, Oreg., for the year ending Sept. 30, 1911.

[J. D. West, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.2	0.3	4.7	3.5	6.0	2.0	2.6	1.5	1.7	0.7	0.4	0.4
2	.3	.3	4.5	3.3	5.8	1.9	2.4	1.5	1.6	.8	.4	.4
3	.4	.4	6.0	3.3	4.8	1.8	2.0	1.5	1.5	.8	.4	.4
4	2.0	.35	5.4	3.1	4.5	1.9	2.3	1.6	1.5	.8	.4	.4
5	1.2	.3	4.6	3.0	4.5	1.9	2.0	1.8	1.3	.7	.4	5
6	.8	3	4.0	3.0	4.3	3.2	2.0	2.5	1.3	.7	.4	2.9
7	.75	.5	3.7	2.9	4.4	3.0	1.9	2.1	1.3	.7	.4	1.5
8	.7	4.0	3.5	2.9	3.8	3.2	1.6	1.8	1.3	.7	.4	1.0
9	.5	3.5	4.2	3.0	3.5	3.0	1.7	1.9	1.2	.7	.4	.8
10	.4	1.9	4.1	3.6	3.3	3.0	1.9	2.5	1.2	.6	.4	1.1
11	.4	3.0	3.6	3.7	4.4	3.0	2.5	2.4	1.2	.6	.4	1.0
12	.5	2.5	3.3	3.3	4.2	2.8	2.7	2.3	1.2	.6	.4	.7
13	.8	1.4	3.0	3.1	4.8	2.7	2.5	2.4	1.1	.6	.4	.6
14	1.0	1.3	2.6	3.0	4.2	2.5	2.5	2.5	1.1	.5	.4	.6
15	.6	1.1	2.5	2 8	3.0	2.5	2.3	2.5	1.1	.5	.4	.7
16	.6	1.0	2.5	2.6	3.6	2.5	2.9	2.4	1.0	.5	.3	1.0
17	.5	1.0	2.7	2.6	3.5	2.5	2.7	2.4	1.0	.8	.3	.8
18	.5	1.1	5.0	5.9	3.5	2.5	3.0	4.4	1.0	.6	.3	.7
19	.5	1.6	4.6	10.6	3.5	2.5	3.0	6.0	1.0	.5	.4	.7
20	.5	1.6	3.5	8.0	3 5	2.5	2.9	4.7	1.0	.5	.4	.6
21	.5	1.8	3.3	5.8	3.5	2.5	2.8	3.9	.8	.5	.4	.5
22	.4	4.0	3.0	4.6	2.6	2.5	2.8	3.2	.8	.5	.4	.5
23	.5	6.6	2.9	4.0	2.6	2.6	2.6	3.0	.8	.5	.4	.5
24	.4	5.0	3.3	4.0	2.5	2.6	2.5	2.7	.8	.5	.4	.5
25	.4	3.6	3.1	3.9	2.5	2.7	2.3	2.5	.8	.5	.4	.5
26	.3	3.4	3.1	3.7	2.6	2.6	2.1	2.1	.8	.5	.4	.6
27	.35	3.5	3.3	3.9	2.2	2.6	1.9	2.0	.8	.4	.4	1.6
28	.35	10.2	3.2	4.0	2.0	2.5	1.8	2.0	.9	.4	.4	1.1
29	.4	12.2	3.1	3.7	......	2.5	1.7	1.8	.9	.4	.4	.9
30	.3	7.5	3.3	3.9	......	2.5	1.6	1.7	.8	.4	.4	.8
31	.3	......	3.7	4.9	......	2.5	......	1.7	......	.4	.4	......

Daily discharge, in second-feet, of Coast Fork of Willamette River near Goshen, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	46	58	4,310	2,590	6,550	995	1,550	620	765	172	70	42
2	58	58	4,000	2,320	6,190	917	1,350	620	690	220	70	42
3	77	77	6,550	2,320	4,470	840	995	620	620	220	70	42
4	995	68	5,480	2,090	4,000	917	1,250	690	620	220	70	42
5	435	58	4,150	1,980	4,000	917	995	840	495	172	70	60
6	220	58	3,290	1,980	3,710	2,200	995	1,450	495	172	60	1,870
7	196	100	2,870	1,870	3,850	1,980	917	1,080	495	172	60	620
8	172	3,290	2,590	1,870	3,010	2,200	690	840	495	172	60	320
9	100	2,590	3,570	1,980	2,590	1,980	765	917	435	172	60	220
10	77	917	3,430	2,730	2,320	1,980	917	1,450	435	130	60	375
11	77	1,980	2,730	2,870	3,850	1,980	1,450	1,350	435	130	50	320
12	100	1,450	2,320	2,320	3,570	1,760	1,650	1,250	435	130	50	172
13	220	557	1,980	2,090	4,470	1,650	1,450	1,350	375	130	50	130
14	320	495	1,550	1,980	3,570	1,450	1,450	1,450	375	100	50	130
15	130	375	1,450	1,760	3,150	1,450	1,250	1,450	375	100	50	172
16	130	320	1,450	1,550	2,730	1,450	1,870	1,350	320	100	40	320
17	100	320	1,650	1,550	2,590	1,450	1,650	1,350	320	100	40	220
18	100	375	4,800	6,370	2,590	1,450	1,980	3,850	320	100	40	172
19	100	690	4,150	16,200	2,590	1,450	1,980	6,550	320	100	45	172
20	100	690	2,590	10,400	2,590	1,450	1,870	4,310	320	100	45	130
21	100	840	2,320	6,190	2,590	1,450	1,760	3,150	220	90	45	100
22	77	3,290	1,980	4,150	1,550	1,450	1,760	2,200	220	90	45	100
23	100	7,650	1,870	3,290	1,550	1,550	1,550	1,980	220	90	44	100
24	77	4,800	2,320	3,290	1,450	1,550	1,450	1,650	220	90	44	100
25	77	2,730	2,090	3,150	1,450	1,650	1,250	1,450	220	90	44	100
26	58	2,450	2,090	2,870	1,550	1,550	1,080	1,080	220	90	43	130
27	68	2,590	2,320	3,150	1,160	1,550	917	995	220	80	43	690
28	68	15,200	2,200	3,290	995	1,450	840	995	270	80	42	375
29	77	20,200	2,090	2,870	....	1,450	765	840	270	80	42	270
30	58	9,400	2,320	3,150	....	1,450	690	765	220	80	42	220
31	58	....	2,870	4,630	....	1,450	....	765	....	80	42	....

NOTE.—Discharge determined from a rating curve well defined below 15,000 second-feet.

Monthly discharge of Coast Fork of Willamette River near Goshen, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	995	46	147	9,040	A.
November	20,200	58	2,790	166,000	A.
December	6,550	1,450	2,880	177,000	A.
January	16,200	1,550	3,510	216,000	A.
February	6,550	995	3,020	168,000	A.
March	2,200	840	1,520	93,500	A.
April	1,980	690	1,300	77,400	A.
May	6,550	620	1,590	97,800	A.
June	765	220	381	22,700	A.
July	220	80	124	7,620	A.
August	70	40	51.2	3,150	C.
September	1,870	42	259	15,400	C.
The year	20,200	40	1,460	1,050,000	

ROW RIVER NEAR DISSTON, OREG.

Location.—In sec. 30, T. 21 S., R. 1 E., at the Prather Creek ranger station, 2 miles above Disston.

Records available.—September 27, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Clean and rocky; practically permanent.

Discharge measurements.—Made by wading.

Estimates withheld for additional data.

Discharge measurements of Row River near Disston, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*
Oct. 18	B. F. Heintzleman	1.25	13
1911.			
Jan. 27	B. F. Heintzleman	2.41	150
Apr. 29	do	2.12	95
Aug. 25	R. C. Pierce	.72	7.6

Daily gage height, in feet, of Row River near Disston, Oreg., for the year ending Sept. 30, 1911.

[E. S. Holderman, observer.]

Day.	Oct.	Nov.	Dec.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	0.9	3.2	....	2.1	....	2.1	2.1	1.6	0.8	0.8
2	....	.9	2.9	....	2.1	....	2.1	2.0	1.6	.8	.8
3	1.2	1.1	3.45	....	2.1	2.5	2.1	2.0	1.4	.8	.8
4	2.2	1.0	3.6	....	2.1	2.5	2.6	2.0	1.4	.8	1.5
5	1.9	1.0	3.1	....	2.8	2.4	2.5	1.9	1.3	.8	3.1
6	....	1.0	2.8	....	2.9	2.4	2.4	1.9	1.3	.8	2.4
7	....	1.6	2.7	2.6	3.0	2.4	2.4	1.8	1.3	.8	2.1
8	1.2	....	2.75	2.6	2.9	2.4	2.2	1.8	1.2	.8	1.8
9	1.1	....	3.4	2.6	2.7	2.4	2.5	1.8	1.2	.8	1.8
10	1.1	....	3.0	2.7	2.7	2.5	2.4	1.7	1.1	.8	1.8
11	1.2	2.2	2.7	2.7	2.7	2.4	2.4	1.7	1.1	.8	1.8
12	1.4	2.2	2.5	....	2.6	2.3	2.4	1.7	1.1	.8	1.8
13	1.3	2.1	2.5	2.6	2.6	2.3	2.7	1.7	1.1	.8	1.8
14	1.3	1.8	2.4	2.6	2.6	2.3	2.5	1.6	1.1	.8	1.8
15	1.2	1.7	2.4	2.6	2.8	2.5	2.5	1.5	1.1	.8	2.1
16	1.1	1.6	2.3	2.7	2.8	2.7	2.3	1.4	1.1	.8	2.1
17	1.1	1.5	2.9	2.7	2.9	2.6	2.8	1.4	1.1	.8	....
18	1.3	2.1	....	2.7	2.9	2.7	3.4	1.4	1.1	.8	....
19	1.2	2.0	....	2.6	....	2.9	3.8	1.4	1.0	.8	....
20	1.1	2.1	....	2.6	....	2.7	3.5	1.4	1.0	.8	....
21	1.1	2.85	....	2.5	2.7	2.7	3.1	1.4	1.0	.8	....
22	1.1	3.0	....	2.5	2.7	2.6	2.7	1.4	1.0	.8	....
23	1.1	4.9	....	2.5	2.8	2.5	2.6	1.4	1.0	.7	....
24	1.0	3.1	....	2.4	2.9	2.5	2.6	1.4	1.0	.7	....
25	1.0	2.9	....	2.4	2.9	2.5	2.4	1.4	.9	.7	....
26	....	2.6	....	2.4	2.8	2.5	2.2	1.3	.9	.7	....
27	....	3.0	....	2.2	2.6	2.4	2.1	1.6	.9	.7	....
28	....	5.85	....	2.1	2.6	2.2	2.1	1.6	.8	.7	....
29	.9	5.1	....	....	2.5	2.1	2.1	1.7	.8	.7	....
30	.9	3.8	....	....	2.5	2.1	2.1	1.9	.8	.7	....
31	.9	....	....	....	2.5	....	2.1	....	.8	.8	....

McKENZIE RIVER NEAR McKINZIE BRIDGE, OREG.

Location.—In sec. 14, T. 16 S., R. 5 E., at the highway bridge near McKinzie Bridge, Oreg.

Records available.—August 8, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff attached to the abutment of the highway bridge at McKinzie Bridge. A second gage has been installed at the Paradise ranger station, 2 miles above McKinzie Bridge.

Channel.—Rocky; practically permanent.

Discharge measurements.—Made from the highway bridge at McKinzie Bridge, or from a cable at the ranger station.

Accuracy.—Results good.

Discharge measurements of McKenzie River near McKinzie Bridge, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.		Discharge.
		Upper gage.	Lower gage.	
1910.		*Feet.*	*Feet.*	*Sec.-ft.*
Oct 12	B. F. Heintzleman	1.50	2.00	1,130
Dec. 19	.....do	2.27	2.75	1,790
1911.				
Mar. 8	B. F. Heintzleman	1.82	2.20	1,220
10	.....do	1.84	2.20	1,250
May 4	.....do	2.44	2.90	1,790
Aug. 15	.....do	1.96	......	1,320

Daily gage height, in feet, of McKenzie River at Paradise ranger station, near McKinzie Bridge, Oreg., for the year ending Sept. 30, 1911.

[S. L. Taylor, observer. Gage at ranger station.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.6	......	2.95	2.0	2.0	1.7	2.4	......	......	......	1.8	1.7
2	1.6	......	3.05	2.0	2.0	1.7	2.4	......	......	......	1.8	1.7
4	1.7	......	3.6	2.0	2.0	1.7	2.3	......	......	......	1.8	1.7
4	1.75	......	3.4	2.0	2.0	1.7	2.2	2.5	2.4	......	1.8	1.7
5	......	......	3.2	2.0	2.0	1.7	2.2	2.5	2.4	......	1.8	1.7
5	......	......	3.0	2.0	2.0	1.8	2.2	......	......	......	1.8	......
7	......	......	2.8	2.0	2.0	1.8	2.1	......	......	......	1.8	......
8	......	......	2.9	2.0	1.9	1.8	2.1	2.5	......	......	1.8	......
9	1.55	......	3.1	2.0	1.9	1.8	2.2	......	......	......	1.8	1.7
10	1.55	......	2.85	2.0	1.9	1.8	2.2	......	......	......	1.8	......
11	1.55	......	2.8	2.0	1.9	1.8	2.2	......	2.4	......	1.8	1.7
12	1.6	......	2.8	2.0	1.9	1.8	2.1	......	......	......	......	1.7
13	1.55	......	2.6	1.9	1.9	1.8	2.1	......	2.4	......	1.8	1.7
14	......	......	2.55	1.9	1.9	1.8	2.1	......	2.4	......	......	1.7
15	......	......	2.45	1.9	1.8	1.9	2.1	......	2.3	......	1.8	......
16	1.6	......	......	......	1.8	1.9	......	......	2.2	......	1.7	......
17	......	......	2.3	1.8	1.8	2.0	2.1	2.4	2.2	......	1.7	......
18	......	......	2.3	2.0	1.8	2.0	2.1	3.0	......	......	1.7	......
19	......	......	2.3	2.3	1.8	2.0	2.1	2.9	......	2.0	1.7	......
20	......	......	2.2	2.2	1.8	2.5	2.1	2.8	......	2.0	1.7	......
21	......	......	2.2	2.1	1.8	......	2.1	......	......	1.9	1.7	......
22	......	......	2.15	2.0	1.8	2.2	2.2	......	......	1.9	......	......
23	1.55	......	2.15	2.0	1.8	2.3	2.2	......	......	1.9	1.7	......
24	1.55	......	2.2	2.0	1.8	2.2	2.2	2.6	......	1.9	1.7	......
25	1.55	2.35	2.15	2.0	1.8	2.2	2.3	2.5	......	1.9	......	......
26	1.55	2.3	2.1	2.0	1.8	2.2	......	2.4	......	1.9	1.7	......
27	1.55	2.3	2.1	2.0	1.8	2.1	......	2.4	......	1.9	......	......
28	1.5	2.7	2.1	2.0	1.7	2.1	......	......	......	1.9	1.7	......
29	1.5	3.4	2.1	1.9	......	2.1	......	......	......	1.9	......	......
30	1.5	3.2	2.1	2.0	......	2.2	......	......	......	1.8	......	......
31	1.5	......	......	2.0	......	2.3	......	......	......	1.8	1.7	......

Daily gage height, in feet, of McKenzie River at McKinzie Bridge, Oreg., for the year ending Sept. 30, 1911.

[Frances Arnold, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.
1	....	1.9	3.5	2.5	2.5	2.1	2.6	2.6
2	....	1.9	3.7	2.4	2.5	2.1	2.8	2.7
3	....	1.9	4.3	2.4	2.5	2.1	2.7	2.7
4	....	1.9	4.0	2.4	....	2.1	2.7	2.8
5	....	1.9	3.7	2.4	....	2.2	2.6	2.9
6	....	1.9	3.5	2.4	2.4	2.2	2.6	2.9
7	....	2.3	3.4	2.4	2.3	2.2	2.5	....
8	....	2.5	3.5	....	2.3	2.2	....	2.9
9	....	2.5	3.3	2.5	2.3	2.2	....	2.9
10	....	2.7	3.2	2.5	2.3	2.2	2.7	2.9
11	....	2.5	....	2.5	2.3	2.2	2.6	2.9
12	....	2.4	3.1	2.4	2.4	2.2	2.5	....
13	2.0	2.2	3.1	2.4	2.4	2.2	2.5	2.9
14	....	2.2	3.0	2.4	2.3	2.3	2.5	....
15	....	2.2	2.9	....	2.3	2.3	2.5	2.8
16	....	2.2	3.0	2.2	2.2	2.4	2.5	2.8
17	....	2.2	2.9	2.7	2.3	2.4	2.5	3.0
18	....	2.2	2.9	2.7	2.3	....	2.5	3.6
19	....	2.2	2.8	2.5	2.3	2.4	2.5	3.4
20	....	3.3	2.8	2.5	2.2	2.5	2.5	....
21	....	3.6	2.7	2.5	2.2	2.5	2.6	3.3
22	1.9	3.8	2.6	2.5	....	2.6	2.6	3.2
23	....	4.0	2.6	2.4	2.2	2.8	2.6	3.3
24	....	3.4	....	2.4	2.2	2.7	2.7	3.1
25	....	3.2	....	2.4	....	2.8	2.8	3.0
26	1.9	3.1	....	2.4	....	....	2.8	3.0
27	....	3.2	....	2.4	2.2	2.5	2.7	....
28	1.9	3.4	....	2.4	2.2	2.5	2.7	....
29	1.9	4.1	....	2.3	....	2.5	....	....
30	1.9	3.7	....	2.4	....	2.6	2.6	....
31	1.9	....	....	2.5	....	2.8	....	....

Daily discharge, in second-feet, of McKenzie River at Paradise ranger station, near McKinzie Bridge, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1,120	....	2,640	1,490	1,490	1,130	1,770	1,470	1,770	....	1,210	1,130
2	1,120	....	2,800	1,490	1,490	1,130	1,770	1,570	1,770	....	1,210	1,130
3	1,210	....	3,710	1,490	1,490	1,130	1,670	1,770	1,770	....	1,001	1,130
4	1,260	....	3,370	1,490	1,490	1,130	1,570	1,880	1,770	....	1,210	1,130
5	1,220	....	3,040	1,490	1,490	1,130	1,570	1,880	1,770	....	1,210	1,130
6	1,190	....	2,720	1,490	1,490	1,210	1,570	1,880	1,770	....	1,210	1,400
7	1,150	....	2,420	1,490	1,490	1,210	1,470	1,880	1,770	....	1,210	1,200
8	1,120	....	2,570	1,490	1,390	1,210	1,470	1,880	1,770	....	1,210	1,200
9	1,080	....	2,880	1,490	1,390	1,210	1,570	1,880	1,770	....	1,210	1,130
10	1,080	....	2,500	1,490	1,390	1,210	1,570	1,770	1,770	....	1,210	1,130
11	1,080	....	2,420	1,490	1,390	1,210	1,570	1,670	1,770	....	1,210	1,130
12	1,120	....	2,420	1,490	1,390	1,210	1,470	1,670	1,770	....	1,210	1,130
13	1,080	....	2,150	1,390	1,390	1,210	1,470	1,670	1,770	....	1,210	1,130
14	1,090	....	2,090	1,390	1,390	1,210	1,470	1,570	1,770	....	1,210	1,130
15	1,110	....	1,970	1,390	1,300	1,290	1,470	1,570	1,670	....	1,210	....
16	1,120	....	1,880	1,340	1,300	1,290	1,470	1,570	1,570	....	1,130	....
17	1,120	....	1,800	1,300	1,300	1,380	1,470	1,770	1,570	....	1,130	....
18	1,110	....	1,800	1,490	1,300	1,380	1,470	2,540	....	....	1,130	....
19	1,100	....	1,800	1,800	1,300	1,380	1,470	2,400	....	1,380	1,130	....
20	1,100	....	1,690	1,690	1,300	1,880	1,470	2,260	....	1,380	1,130	....
21	1,090	....	1,690	1,590	1,300	1,720	1,470	2,200	....	1,290	1,130	....
22	1,090	....	1,640	1,490	1,300	1,570	1,570	2,130	....	1,290	1,130	....
23	1,080	....	1,640	1,490	1,300	1,670	1,570	2,060	....	1,290	1,130	....
24	1,080	....	1,690	1,490	1,300	1,570	1,570	2,000	....	1,290	1,130	....
25	1,080	1,860	1,640	1,490	1,300	1,570	1,670	1,880	....	1,290	1,130	....
26	1,080	1,800	1,590	1,490	1,300	1,570	1,670	1,770	....	1,290	1,130	....
27	1,080	1,800	1,590	1,490	1,300	1,470	1,570	1,770	....	1,290	1,130	....
28	1,040	2,280	1,590	1,490	1,210	1,470	1,470	1,770	....	1,290	1,130	....
29	1,040	3,370	1,590	1,390	....	1,470	1,470	1,770	....	1,290	1,130	....
30	1,040	3,040	1,590	1,490	....	1,570	1,470	1,770	....	1,210	1,130	....
31	1,040	....	1,540	1,490	....	1,670	....	1,770	....	1,210	1,130	....

NOTE.—Discharge determined from two rating curves, both well defined below 2,700 second-feet. Discharge estimated Apr. 26 to May 3, May 9 to 16, and Sept. 6 to 8. Discharge interpolated for other days when no gage height was reported.

Daily discharge, in second-feet, of McKenzie River near McKinzie Bridge, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.
1	....	1,060	2,490	1,480	1,480	1,180	1,560	1,560
2	....	1,060	2,750	1,400	1,480	1,180	1,740	1,650
3	....	1,060	3,600	1,400	1,480	1,180	1,650	1,650
4	....	1,060	3,160	1,400	1,450	1,180	1,650	1,740
5	....	1,060	2,750	1,400	1,430	1,250	1,560	1,840
6	....	1,060	2,490	1,400	1,400	1,250	1,560	1,840
7	....	1,320	2,370	1,400	1,320	1,250	1,480	1,840
8	....	1,480	2,490	1,440	1,320	1,250	1,530	1,840
9	....	1,480	2,250	1,480	1,320	1,250	1,590	1,840
10	....	1,650	2,140	1,480	1,320	1,250	1,650	1,840
11	....	1,480	2,090	1,480	1,320	1,250	1,560	1,840
12	....	1,400	2,040	1,400	1,400	1,250	1,480	1,840
13	1,120	1,250	2,040	1,400	1,400	1,250	1,480	1,840
14	1,120	1,250	1,940	1,400	1,320	1,320	1,480	1,790
15	1,110	1,250	1,840	1,320	1,320	1,320	1,480	1,740
16	1,100	1,250	1,940	1,250	1,250	1,400	1,480	1,740
17	1,100	1,250	1,840	1,650	1,320	1,400	1,480	1,940
18	1,090	1,250	1,840	1,650	1,320	1,400	1,480	2,620
19	1,080	1,250	1,740	1,480	1,320	1,400	1,480	2,370
20	1,070	2,250	1,740	1,480	1,250	1,480	1,480	2,310
21	1,070	2,620	1,650	1,480	1,250	1,480	1,560	2,250
22	1,060	2,880	1,560	1,480	1,250	1,560	1,560	2,140
23	1,060	3,160	1,560	1,400	1,250	1,740	1,560	2,140
24	1,060	2,370	1,560	1,400	1,250	1,650	1,650	2,040
25	1,060	2,140	1,550	1,400	1,250	1,740	1,740	1,940
26	1,060	2,040	1,540	1,400	1,250	1,610	1,740	1,940
27	1,060	2,140	1,530	1,400	1,250	1,480	1,650	....
28	1,060	2,370	1,520	1,400	1,250	1,480	1,650	....
29	1,060	3,300	1,510	1,320	....	1,480	1,600	....
30	1,060	2,750	1,500	1,400	....	1,560	1,560	....
31	1,060	....	1,490	1,480	....	1,740	....	....

NOTE.—Discharged determined from a rating curve well defined below 3,000 second-feet. Discharge interpolated for days when no gage height was reported.

Monthly discharge of McKenzie River at Paradise ranger station, near McKinzie Bridge, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	1,260	1,040	1,110	68,200	B.
November 25–30	3,370	1,800	2,360	28,100	B.
December	3,710	1,540	2,140	132,000	B.
January	1,800	1,300	1,490	91,600	A.
February	1,490	1,210	1,370	76,100	A.
March	1,880	1,130	1,370	84,200	A.
April	1,770	1,470	1,540	91,600	A.
May	2,540	1,470	1,850	114,000	B.
June 1-17	1,770	1,570	1,740	58,700	B.
July 19–31	1,380	1,210	1,290	33,300	A.
August	1,210	1,130	1,170	71,900	A.
September 1-14	1,400	1,130	1,160	32,200	B.

Monthly discharge of McKenzie River near McKenzie Bridge, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October 13-31	1,120	1,060	1,080	40,700	B.
November	3,300	1,060	1,730	103,000	A.
December	3,600	1,490	2,020	124,000	A.
January	1,650	1,250	1,430	87,900	A.
February	1,480	1,250	1,330	73,900	A.
March	1,740	1,180	1,390	85,500	A.
April	1,740	1,480	1,570	93,400	A.
May 1-26	2,620	1,560	1,930	99,500	A.
The period				708,000	

McKENZIE RIVER AT MARTINS RAPIDS, NEAR VIDA, OREG.

Location.—In the SW. ¼ sec. 36, T. 16 S., R. 2 E., at the head of Martins Rapids, 2 miles above Vida and 3 miles above Gate Creek.

Records available.—June 25, 1910, to March 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Rocky; practically permanent.

Discharge measurements.—Made from boat near gage.

Cooperation.—Records are furnished by H. M. Byllesby & Co.

No discharge measurements reported during the year.

Estimates withheld for additional data.

Daily gage height, in feet, of McKenzie River at Martins Rapids, near Vida, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1	2.2	2.2	5.3	3.2	3.5	2.6	16	2.3	2.7	4.1	2.7	2.9	3.5
2	2.3	2.2	5.2	3.1	3.7	2.6	17	2.3	2.6	4.9	2.7	2.8	3.5
3	2.5	2.2	6.3	3.0	3.5	2.5	18	2.5	2.8	4.2	3.5	3.0	3.5
4	2.4	2.2	6.6	3.0	3.3	2.7	19	2.4	2.9	3.7	5.2	3.0	3.5
5	2.8	2.2	5.3	3.0	3.3	2.8	20	2.3	2.9	3.6	4.2	2.9	3.8
6	2.7	2.2	5.0	3.0	3.2	2.9	21	2.3	4.4	3.3	3.7	2.9	3.8
7	2.4	2.2	4.5	3.0	3.1	3.1	22	2.3	5.8	3.1	3.4	2.8	3.9
8	2.4	4.5	4.3	2.9	3.0	3.2	23	2.3	8.7	3.1	3.2	2.8	4.2
9	2.3	3.6	5.4	3.3	2.9	3.2	24	2.0	5.6	3.6	3.2	2.7	4.1
10	2.3	3.7	4.8	3.2	2.9	3.1	25	2.3	4.2	3.6	3.1	2.7	4.0
11	2.3	4.2	4.4	3.0	3.1	3.2	26	2.3	3.5	3.2	3.1	2.7	3.7
12	2.4	3.5	4.2	2.9	3.0	3.1	27	2.2	3.6	3.2	2.9	2.6	3.5
13	2.4	3.1	4.0	2.9	3.2	3.1	88	2.2	5.8	3.1	3.0	2.6	3.3
14	2.3	2.9	3.7	2.8	3.0	3.2	29	2.2	8.4	3.1	2.9	......	3.4
15	2.3	2.8	3.8	2.8	2.9	3.4	30	2.2	6.8	3.3	3.0	......	3.6
							31	2.2	......	3.3	3.7	......	4.0

McKENZIE RIVER NEAR SPRINGFIELD, OREG.

Location.—In sec. 32, T. 17 S., R. 1 W., at Hendrick's Ferry (an old river crossing replaced by a highway bridge in 1908), 3 miles below Walterville, 3 miles above Camp Creek, and 11 miles above Springfield.

Records available.—September 12, 1905, to September 30, 1911.

Drainage area.—960 square miles.

Gage.—Vertical staff on left bank.

Channel.—Coarse gravel and small bowlders; shifting.

Discharge measurements.—Made from cable 200 feet below gage.

Diversions.—The power canal of the Eugene municipal plant has diverted water around the station since about February 14, 1911. Record has been kept of this diversion and the amounts added to the discharge of the river station.

Accuracy.—Results good.

Discharge measurements of McKenzie River near Springfield, Oreg., in 1908–1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1908.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Mar. 17	P. A. Cupper	[a]6.58	13,800	Jan. 24	B. F. Heintzleman	2.97	4,290
19	.....do	[a]4.96	9,160	Mar. 14	.....do	2.75	3,860
Sept. 22	H. D. McGlashan	[a]2.18	1,940	May 10	.....do	3.22	4,430
Oct. 9	.....do	[a]1.66	1,820	Aug. 29	R. C. Pierce	1.06	1,540
1910.				Sept. 29	E. C. Murphy	1.40	1,870
Aug. 6	Henshaw and Davenport	[a]1.32	2,080				
Oct. 20	B. F. Heintzleman	[a]1.30	1,850				

[a] Gage height corrected for error in datum.

NOTE.—The following discharge measurements of Eugene power canal were made: Sept. 7, 1911, gage height, 0.98 foot; discharge, 142 second-feet; Sept. 29, 1911, gage height, 1.12 feet; discharge, 154 second-feet.

Daily gage height, in feet, of McKenzie River near Springfield, Oreg., for the year ending Sept. 30, 1911.

[Mrs. N. M. Hendricks, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.25	1.15	5.75	2.9	3.4	1.7	3.2	2.6	3.5	2.3	1.3	1.0
2	1.25	1.15	4.9	2.8	3.7	2.0	3.4	2.8	3.4	2.1	1.3	1.3
3	2.25	1.15	5.85	2.8	3.2	2.0	3.1	3.2	3.3	2.0	1.4	1.2
4	2.45	1.15	5.65	2.6	3.1	2.2	3.0	3.2	3.0	2.0	1.3	1.4
5	1.85	1.05	5.25	2.6	3.2	2.3	2.9	3.3	3.0	1.9	1.3	2.5
6	1.55	1.15	4.6	2.7	3.0	2.4	2.7	3.2	3.0	1.8	1.4	2.1
7	1.4	1.75	4.25	2.6	2.8	3.0	2.6	3.0	2.8	1.8	1.3	1.6
8	1.3	4.3	4.25	2.6	2.8	2.7	2.6	3.2	2.8	1.7	1.2	1.6
9	1.25	2.75	4.85	2.7	2.7	2.8	2.6	3.4	2.8	1.7	1.3	1.6
10	1.25	3.1	4.05	2.8	2.8	2.8	2.8	3.2	2.6	1.8	1.2	1.4
11	1.25	3.65	3.95	2.7	2.9	2.6	2.8	4.1	2.9	1.6	1.2	1.4
12	1.35	2.85	3.85	2.6	2.8	2.7	2.6	3.5	3.2	1.6	1.3	1.3
13	1.35	2.35	3.65	2.4	2.9	2.9	2.6	3.4	3.1	1.7	1.2	1.2
14	1.45	2.25	3.45	2.3	2.8	2.7	2.6	3.3	2.9	1.6	1.2	1.2
15	1.35	2.05	3.25	2.4	2.5	3.0	2.6	3.2	3.0	1.6	1.3	1.7
16	1.45	1.85	3.25	2.2	2.4	3.2	2.8	3.2	2.8	1.7	1.2	1.4
17	1.45	1.75	3.55	2.3	2.6	3.0	2.8	3.6	2.6	1.5	1.2	......
18	1.45	2.0	3.45	2.6	2.7	3.0	2.9	5.5	2.6	1.5	1.2	1.4
19	1.4	2.15	3.15	5.1	2.7	3.2	2.8	5.2	2.4	1.6	1.2	1.4
20	1.35	3.35	2.95	4.0	2.7	3.2	2.9	4.5	2.3	1.5	1.1	1.3
21	1.3	4.7	2.85	3.7	2.5	3.3	2.8	4.2	2.5	1.4	1.2	1.7
22	1.25	4.85	2.75	3.2	2.4	3.2	3.0	4.2	2.4	1.6	1.1	1.6
23	1.25	7.15	2.7	3.1	2.4	3.2	2.9	4.0	2.3	1.4	1.1	1.5
24	1.3	4.75	3.05	3.0	2.2	3.5	3.2	3.6	2.3	1.4	1.2	1.6
25	1.2	4.35	3.05	2.9	2.2	3.5	3.4	3.4	1.9	1.5	1.1	1.5
26	1.2	3.55	2.75	2.7	2.2	3.2	3.2	3.2	2.0	1.4	1.1	2.1
27	1.15	3.45	2.85	2.7	2.1	2.9	3.1	3.2	2.2	1.4	1.1	1.8
28	1.15	7.0	2.75	2.6	2.0	2.8	2.8	3.0	2.1	1.4	1.0	1.4
29	1.15	7.65	2.75	2.6	......	2.8	2.7	3.1	2.3	1.4	1.0	1.4
30	1.15	7.15	2.95	3.0	......	3.1	2.6	3.4	2.3	1.3	1.2	1.4
31	1.15	......	3.1	3.3	......	3.4	......	3.2	......	1.4	1.0	......

NOTE.—Gage heights Oct. 1 to Dec. 31. 1910, have been corrected for an error in gage datum and do not agree with those published in Water-Supply Paper 292, p. 556.

Daily discharge, in second-feet, of McKenzie River near Springfield, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2,020	1,630	11,200	4,110	5,040	2,480	4,470	3,470	5,050	3,030	1,780	1,490
2	2,020	1,630	8,630	3,950	5,710	2,830	4,850	3,780	4,850	2,750	1,780	1,780
3	3,160	1,630	11,600	3,950	4,620	2,830	4,290	4,470	4,660	2,620	1,890	1,680
4	3,430	1,630	10,900	3,650	4,440	3,090	4,110	4,470	4,110	2,620	1,780	1,890
5	2,430	1,540	9,610	3,650	4,620	3,220	3,940	4,660	4,110	2,490	1,780	3,320
6	2,070	1,630	7,860	3,800	4,270	3,360	3,620	4,470	4,110	2,370	1,890	2,750
7	1,890	2,310	6,990	3,650	3,950	4,270	3,470	4,110	3,780	2,370	1,780	2,130
8	1,780	7,110	6,990	3,650	3,950	3,800	3,470	4,470	3,780	2,250	1,680	2,130
9	1,730	3,880	8,500	3,800	3,800	3,950	3,470	4,850	3,780	2,250	1,780	2,130
10	1,730	4,440	6,520	3,950	3,950	3,950	3,780	4,470	3,470	2,370	1,680	1,890
11	1,730	5,600	6,280	3,800	4,110	3,650	3,780	6,440	3,940	2,130	1,680	1,890
12	1,840	4,030	6,060	3,650	3,950	3,800	3,470	5,050	4,470	2,130	1,780	1,780
13	1,840	3,290	5,600	3,360	4,110	4,110	3,470	4,850	4,290	2,250	1,680	1,680
14	1,950	3,160	5,150	3,220	3,950	3,800	3,470	4,660	3,940	2,130	1,680	1,680
15	1,840	2,900	4,720	3,360	3,500	4,270	3,470	4,470	4,110	2,130	1,780	2,250
16	1,950	2,650	4,720	3,090	3,360	4,620	3,780	4,470	3,780	2,250	1,680	1,890
17	1,950	2,540	5,370	3,220	3,650	4,270	3,780	5,270	3,470	2,010	1,680	1,890
18	1,950	2,830	5,150	3,650	3,800	4,270	3,940	10,400	3,470	2,010	1,680	1,890
19	1,890	3,020	4,530	9,180	3,800	4,620	3,780	9,420	3,170	2,130	1,680	1,890
20	1,840	4,940	4,190	6,400	3,800	4,620	3,940	7,460	3,030	2,010	1,580	1,780
21	1,780	8,110	4,030	5,710	3,500	4,830	3,780	6,680	3,320	1,890	1,680	2,250
22	1,730	8,500	3,940	4,620	3,360	4,620	4,110	6,680	3,170	2,130	1,580	2,130
23	1,730	16,600	3,800	4,440	3,360	4,620	3,940	6,200	3,030	1,890	1,580	2,010
24	1,780	8,240	4,360	4,270	3,090	5,260	4,470	5,270	3,030	1,890	1,680	2,130
25	1,680	7,240	4,360	4,110	3,090	5,260	4,850	4,850	2,490	2,010	1,580	2,010
26	1,680	5,370	3,880	3,800	3,090	4,620	4,470	4,470	2,620	1,890	1,580	2,750
27	1,630	5,150	4,030	3,800	2,960	4,110	4,290	4,470	2,890	1,890	1,580	2,370
28	1,630	16,000	3,880	3,650	2,830	3,950	3,780	4,110	2,750	1,890	1,490	1,890
29	1,630	18,900	3,880	3,650	....	3,950	3,620	4,290	3,030	1,890	1,490	1,890
30	1,630	16,600	4,190	4,270	....	4,440	3,470	4,850	3,030	1,780	1,680	1,890
31	1,630	....	4,440	4,830	....	5,040	....	4,470	....	1,890	1,490	....

NOTE.—Discharge determined from two fairly well defined rating curves. Discharge figures for Oct. 1 to Dec. 31, 1910, supersede those published in Water-Supply Paper 292, p. 557. Some water was diverted by the Eugene power canal from Februaiy to May, but the amount was probably a very small percentage of the total flow of the river.

Monthly discharge of McKenzie River near Springfield, Oreg., for the year ending Sept. 30, 1911.

[Drainage area, 960 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	3,430	1,630	1,890	1.97	2.27	116,000	B.
November	18,900	1,540	5,770	6.01	6.70	343,000	B.
December	11,600	3,800	5,980	6.23	7.18	368,000	B.
January	9,180	3,090	4,140	4.31	4.97	255,000	B.
February	5,710	2,830	3,840	4.00	4.16	213,000	B.
March	5,260	2,480	4,080	4.25	4.90	251,000	B.
April	4,850	3,470	3,900	4.06	4.53	232,000	B.
May	10,400	3,470	5,230	5.45	6.28	322,000	B.
June	5,050	2,490	3,760	3.92	4.37	224,000	B.
July	3,030	1,780	2,310	2.41	2.78	142,000	B.
August	1,890	1,490	1,820	1.90	2.19	112,000	B.
September	3,320	1,490	2,180	2.27	2.53	130,000	B.
The year	18,900	1,490	3,740	3.90	52.86	2,710,000	

NOTE.—Mean discharges June to September, 1911, have been increased by 140 second-feet, this amount being the estimated flow in the Eugene power canal for that period. Prior to June 1, 1911, the amount of diversion was small and has not been estimated.

NORTH FORK OF SANTIAM RIVER NEAR HOOVER, OREG.

Location.—In sec. 16, T. 10 S., R. 6 E., 1 mile above Boulder Creek, 2½ miles above Hoover, 2½ miles above Breitenbush Creek, and 4½ miles above Detroit.

Records available.—August 19, 1910, to September 30, 1911; January 24, 1907, to October 31, 1909, at a point 1 mile above Detroit.

Drainage area.—Not measured.

Gage.—Vertical staff on right bank.

Channel.—Gravel and small bowlders; slightly shifting.

Discharge measurements.—Made from cable half a mile below Boulder Creek, the discharge of which is deducted to give the flow at the gage.

Accuracy.—Results good.

Cooperation.—Gage-height record furnished by J. G. Kelley, of Portland, Oreg.

Discharge measurements of North Fork of Santiam River near Hoover, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 5	F. C. Ebert	1.85	635	Mar. 2	B. F. Heintzleman	1.66	491
Nov. 16	J. H. Cave	1.95	696	Apr. 20	....do	2.28	762
				June 23	R. W. Davenport	2.21	718
				Aug. 11	B. F. Heintzleman	1.86	537

Daily gage height, in feet, of North Fork of Santiam River near Hoover, Oreg., for the year ending Sept. 30, 1911.

[L. A. Harris, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.50	1.40	3.15	2.0	2.1	1.65	2.9	2.6	3.3	2.1	1.60	1.45
2	1.50	1.40	3.69	2.0	2.1	1.65	2.9	2.8	3.2	2.1	1.65	1.50
3	2.55	1.44	4.65	1.95	2.0	1.65	2.8	3.0	3.1	2.1	1.60	1.50
4	2.42	1.43	4.33	1.95	2.0	1.70	2.6	3.2	2.9	2.1	1.55	1.60
5	1.92	1.41	3.69	1.95	2.0	1.70	2.5	3.2	2.8	2.1	1.55	1.70
6	....	1.44	3.34	1.90	2.0	1.75	2.4	3.0	2.8	2.1	....	1.65
7	1.64	2.14	3.32	1.90	1.95	1.80	2.3	2.9	2.8	2.0	....	1.55
8	1.55	2.61	3.55	1.95	1.90	1.80	2.3	3.0	2.7	2.0	....	1.50
9	1.53	2.58	3.37	2.0	1.90	1.85	2.4	2.8	2.7	1.90	....	1.65
10	1.52	3.30	3.21	1.95	1.90	1.85	2.4	2.8	2.8	1.90	....	1.55
11	1.48	2.94	3.05	1.95	1.90	1.85	2.4	2.7	3.0	1.85	1.55	1.55
12	1.60	2.71	2.86	1.95	1.90	1.85	2.4	2.8	2.9	1.85	1.50	1.50
13	....	2.40	2.70	1.90	1.90	1.85	2.4	2.8	3.0	1.85	1.55	1.50
14	1.58	2.12	2.59	1.85	1.85	1.85	2.4	2.7	2.9	1.85	1.55	1.50
15	1.55	2.01	2.49	1.85	1.80	1.95	2.3	2.7	2.7	1.85	1.50	1.60
16	1.52	1.95	2.47	1.85	1.80	2.0	2.2	2.7	2.6	1.85	1.50	1.65
17	1.60	1.88	2.42	1.90	1.85	2.1	2.2	2.8	2.5	1.85	1.50	1.60
18	....	1.88	2.34	2.4	1.85	2.1	2.3	3.6	2.5	1.80	1.50	1.55
19	....	1.84	2.27	2.6	1.80	2.2	2.3	3.4	2.4	1.80	1.50	1.50
20	1.51	2.15	2.24	2.5	1.80	2.3	2.3	3.2	2.3	1.75	1.50	1.50
21	1.48	2.83	2.17	2.4	1.75	2.4	2.4	3.2	2.3	1.70	1.50	1.50
22	1.48	3.47	2.14	2.2	1.75	2.5	2.5	3.2	2.3	1.70	1.50	1.45
23	1.48	4.57	2.15	2.2	1.75	2.8	2.6	3.1	2.2	1.70	1.50	1.45
24	1.48	3.62	2.21	2.2	1.75	2.7	2.8	2.9	2.2	1.70	....	1.45
25	1.48	3.08	2.22	2.1	1.75	2.6	2.9	2.8	2.1	1.65	1.50	1.43
26	1.50	2.77	2.18	2.0	1.70	2.5	2.9	2.7	2.2	1.65	1.45	1.70
27	1.46	2.64	2.15	2.0	1.70	2.4	2.8	2.6	2.4	1.65	1.45	1.70
28	1.42	3.01	2.11	2.0	1.70	2.4	2.6	2.6	2.3	1.65	1.45	1.55
29	1.42	3.70	2.08	1.95	....	2.4	2.6	2.8	2.2	1.65	1.45	1.50
30	1.42	3.43	2.13	2.1	....	2.5	2.5	2.9	2.2	1.65	1.45	1.50
31	1.41	....	2.09	2.1	....	2.8	....	3.2	....	1.65	1.45	....

Daily discharge, in second-feet, of North Fork of Santiam River near Hoover, Oreg., for Aug. 26, 1910, to Sept. 30, 1911.

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	448	470	425	1,450	620	675	460	1,240	1,000	1,580	675	440	382
2	......	448	470	425	1,970	620	675	460	1,240	1,160	1.500	675	460	400
3	......	448	1,080	443	3,120	595	620	460	1,160	1,320	1,400	675	440	400
4	......	448	994	438	2,710	595	620	480	1,000	1,500	1,240	675	420	440
5	......	448	681	430	1,970	595	620	480	935	1,500	1,160	675	420	480
6	......	425	608	443	1,620	570	620	502	865	1,320	1,160	675	420	460
7	......	425	535	809	1,600	570	595	525	800	1,240	1,160	620	420	420
8	......	425	492	1,130	1,830	595	570	525	800	1,320	1,080	620	420	400
9	......	425	484	1,110	1,650	620	570	548	865	1,160	1,080	570	420	460
10	......	425	479	1,680	1,500	595	570	548	865	1,160	1,160	570	420	420
11	......	425	461	1,330	1,360	595	570	548	865	1,080	1,320	548	420	420
12	......	425	515	1,200	1,200	595	570	548	865	1,160	1,240	548	400	400
13	......	425	510	980	1,080	570	570	548	865	1,160	1,328	548	420	400
14	......	425	506	797	998	548	548	548	865	1,080	1,240	548	420	400
15	......	425	492	731	928	548	525	595	800	1,080	1,080	548	400	440
16	......	425	479	698	914	548	525	620	735	1,080	1,000	548	400	460
17	......	425	515	659	879	570	548	675	735	1.160	935	548	400	440
18	......	425	502	659	826	865	548	675	800	1,880	935	525	400	420
19	......	425	487	637	780	1,000	525	735	800	1,680	865	525	400	400
20	......	535	474	815	761	935	525	800	800	1,500	800	502	400	400
21	......	425	461	1,290	717	865	502	865	865	1,500	800	480	400	400
22	......	425	461	1,820	699	735	502	935	935	1,500	800	480	400	382
23	......	425	461	3,010	705	735	502	1,160	1,000	1,400	735	480	400	382
24	......	425	461	1,900	742	735	502	1,080	1,160	1,240	735	480	400	382
25	......	425	461	1,390	748	675	502	1,000	1,240	1,160	675	460	400	376
26	448	425	470	1,130	723	620	480	935	1,240	1,080	735	460	382	480
27	448	425	452	1,040	705	620	480	865	1,160	1,000	865	460	382	480
28	461	425	434	1,330	681	620	480	865	1,000	1,000	800	460	382	420
29	470	425	434	1,980	664	595	......	865	1,000	1,160	735	460	382	400
30	448	393	434	1,710	693	675	......	935	935	1,240	735	460	382	400
31	448	......	430	......	670	675	......	1,160	......	1.500	......	460	382	......

NOTE.—Discharge Aug. 26 to Nov. 22, 1910, determined from a rating curve well defined below 1,400 second-feet. Discharge Nov. 23, 1910, to Sept. 30, 1911, determined from a rating curve well defined between 500 and 1,500 second-feet. Discharge interpolated for days when no gage height was reported.

Monthly discharge of North Fork of Santiam River near Hoover, Oreg., for 1910–11.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1910.					
August 26-31	470	448	454	5,400	A.
September	535	393	431	25,600	A.
The period	....	....	....	31,000	
1910-11.					
October	1,080	430	522	32,100	A.
November	3,010	425	1,080	64,300	A.
December	3,120	664	1,190	73,200	A.
January	1,000	548	655	40,300	A.
February	675	480	555	30,800	A.
March	1,160	460	708	43,500	A.
April	1,240	735	948	56,400	A.
May	1,880	1,000	1,270	78,100	A.
June	1,580	675	1,030	61,300	A.
July	675	460	547	33,600	A.
August	460	382	407	25,000	B.
September	480	376	418	24,900	B.
The year	3,120	376	778	564,000	

NORTH FORK OF SANTIAM RIVER NEAR NIAGARA, OREG.

Location.—In sec. 29, T. 9 S., R. 4 E., 1 mile below Niagara and about 15 miles below Breitenbush Creek.

Records available.—December 21, 1908, to November 17, 1910, and June 7 to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Large bowlders; practically permanent.

Discharge measurements.—Made from boat near gage.

Cooperation.—Records furnished by O'Neil Bros. & Callahan, owners of the power site at the station.

Estimates withheld for additional data.

Discharge measurements of North Fork of Santiam River near Niagara, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 25	J. H. Cave	1.45	761	July 1	McCalman	2.08	1,230
Nov. 16	.....do	2.35	1,590	11	.....do	1.98	1,120
17	.....do	2.29	1,580	14	E. Fenger	1.98	1,100
				23	.....do	1.70	1,030
1911.				28	.....do	1.60	895
June 28	McCalman	2.48	1,420	Aug. 7	.....do	1.50	780
				20	.....do	1.40	710

Daily gage height, in feet, of North Fork of Santiam River near Niagara, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	June.	July.	Aug.	Sept.	Day.	Oct.	Nov.	June.	July.	Aug.	Sept.
1	1.4	1.3	......	2.4	1.6	1.5	16	1.6	2.3	3.0	2.0	1.5	1.6
2	1.4	1.3	......	2.4	1.6	1.9	17	1.5	2.3	2.9	1.9	1.5	1.5
3	1.5	1.3	......	2.4	1.6	2.5	18	1.6	......	2.8	1.9	1.5	1.5
4	1.5	1.3	......	2.3	1.6	2.9	19	1.5	......	2.6	1.8	1.5	1.6
5	1.5	1.4	......	2.3	1.5	2.1	20	1.5	......	2.5	1.8	1.4	1.6
6	1.6	1.4	......	2.3	1.5	1.9	21	1.5	......	2.5	1.8	1.4	1.6
7	1.6	1.4	3.2	2.3	1.5	1.6	22	1.5	......	2.5	1.8	1.4	1.6
8	1.6	4.3	3.2	2.2	1.5	1.5	23	1.5	......	2.4	1.7	1.4	1.6
9	2.0	3.7	3.1	2.0	1.5	1.5	24	1.5	......	2.3	1.7	1.4	1.7
10	2.0	5.0	3.1	2.0	1.5	1.6	25	1.45	......	2.2	1.7	1.4	1.5
11	2.0	4.9	3.0	2.0	1.5	1.6	26	1.4	......	2.2	1.7	1.4	1.6
12	2.0	3.8	3.4	2.0	1.5	1.5	27	1.3	......	2.4	1.6	1.4	1.9
13	1.8	3.1	3.4	2.0	1.5	1.6	28	1.3	......	2.5	1.6	1.4	2.2
14	1.7	2.8	3.3	2.0	1.4	1.6	29	1.3	......	2.5	1.6	1.4	2.2
15	1.6	2.6	3.1	2.0	1.5	1.6	30	1.3	......	2.5	1.6	1.4	2.2
							31	1.3	......	......	1.6	1.4	......

NORTH FORK OF SANTIAM RIVER AT MEHAMA, OREG.

Location.—In sec. 18, T. 9 S., R. 2 E., just below the highway bridge at Mehama, about 1½ miles north of Lyons and about 12 miles below the junction of Little North Fork and North Fork.

Records available.—July 16, 1905, to March 31, 1907; October 11, 1910, to September 30, 1911.

Drainage area.—740 square miles.

Gage.—Staff in two sections on right bank; the lower section inclined, the upper vertical.

Channel.—Rock and coarse gravel; shifting in floods.

Discharge measurements.—Made from highway bridge, 150 feet above gage.

Accuracy.—Results good.

Discharge measurements of North Fork of Santiam River at Mehama, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 11	F. C. Ebert	2.48	888	June 23	R. W. Davenport	3.18	1,620

Daily gage height, in feet, of North Fork of Santiam River at Mehama, Oreg., for the year ending Sept. 30, 1911.

[J. W. Irvine, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	2.3	5.8	4.0	4.7	3.1	5.5	4.5	4.5	3.4	2.4	2.2
2	......	2.3	6.5	3.8	4.6	3.1	5.2	4.7	4.5	3.4	2.4	2.2
3	......	2.3	8.6	3.8	4.5	3.0	5.0	4.9	4.3	3.3	2.4	2.2
4	......	2.4	8.0	3.8	4.2	3.2	4.8	5.3	4.3	3.2	2.4	2.3
5	......	2.3	6.9	3.7	4.0	3.2	4.5	5.0	4.2	3.2	2.4	3.2
6	......	2.3	6.1	3.7	4.0	3.5	4.2	5.0	4.0	3.2	2.4	3.0
7	......	5.3	5.8	3.7	4.0	3.5	4.0	4.8	4.0	3.0	2.4	2.4
8	......	6.4	5.7	3.8	3.8	3.8	3.7	4.8	4.0	2.9	2.4	2.4
9	......	5.3	5.7	4.0	3.6	4.1	3.9	4.7	4.1	2.9	2.4	2.4
10	......	6.6	5.7	3.8	3.6	4.1	3.8	4.5	4.1	2.8	2.4	2.4
11	2.5	6.6	5.2	3.7	3.6	4.1	3.8	4.5	4.1	2.8	2.4	2.4
12	2.5	5.1	4.9	3.5	3.6	4.0	3.8	5.0	4.1	2.8	2.3	2.4
13	2.5	4.4	4.6	3.5	3.5	4.0	3.7	4.8	4.3	2.8	2.3	2.4
14	2.5	4.0	4.3	3.4	3.5	4.0	3.7	4.6	4.3	2.8	2.3	2.4
15	2.5	3.7	4.1	3.4	3.5	4.2	3.7	4.5	4.1	2.8	2.3	3.5
16	2.5	3.5	4.1	3.4	3.5	4.4	3.8	4.5	3.9	2.7	2.3	3.2
17	3.1	3.3	4.1	3.5	3.5	4.5	4.0	5.0	3.7	2.7	2.3	2.8
18	3.1	3.5	4.0	6.2	3.5	4.5	4.0	6.8	3.5	2.7	2.3	2.8
19	3.0	3.5	4.0	8.0	3.5	4.8	4.3	7.5	3.5	2.6	2.3	2.6
20	2.7	4.1	3.7	6.5	3.3	5.0	4.5	7.0	3.4	2.5	2.3	2.5
21	2.5	7.7	3.6	5.2	3.3	5.0	4.5	6.0	3.2	2.5	2.3	2.5
22	2.5	7.7	3.5	4.8	3.4	5.2	4.6	5.8	3.2	2.5	2.3	2.4
23	2.5	9.5	3.8	4.4	3.4	5.5	4.8	5.5	3.2	2.5	2.2	2.3
24	2.4	6.0	4.5	4.4	3.3	5.0	5.0	5.2	3.0	2.5	2.2	2.3
25	2.4	5.6	4.3	5.0	3.3	4.5	5.2	5.0	3.0	2.5	2.2	2.3
26	2.4	5.0	4.0	4.5	3.2	4.5	5.5	4.5	3.0	2.5	2.2	2.7
27	2.4	4.8	4.0	4.0	3.2	4.7	4.5	4.2	3.5	2.5	2.2	2.7
28	2.4	5.5	3.9	4.0	3.2	4.8	4.2	4.0	3.5	2.5	2.2	2.5
29	2.3	6.9	4.0	3.6	......	5.0	4.2	4.3	3.5	2.4	2.2	2.5
30	2.3	6.6	4.2	3.8	......	5.5	4.2	4.6	3.5	2.4	2.2	2.5
31	2.3	......	4.0	4.2	......	5.8	......	4.7	......	2.4	2.2	......

Daily discharge, in second-feet, of North Fork of Santiam River at Mehama, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	740	7,200	2,900	4,340	1,560	6,320	3,900	3,900	1,960	830	660
2	......	740	9,420	2,560	4,120	1,560	5,500	4,340	3,900	1,960	830	660
3	......	740	17,500	2,560	3,900	1,440	5,000	4,780	3,480	1,820	830	660
4	......	830	14,900	2,560	3,280	1,680	4,560	5,760	3,480	1,680	830	740
5	......	740	10,800	2,400	2,900	1,680	3,900	5,000	3,280	1,680	830	1,680
6	......	740	8,120	2,400	2,900	2,100	3,280	5,000	2,900	1,680	830	1,440
7	......	5,760	7,200	2,400	2,900	2,100	2,900	4,560	2,900	1,440	830	830
8	......	9,080	6,900	2,560	2,560	2,560	2,400	4,560	2,900	1,320	830	830
9	......	5,760	6,900	2,900	2,250	3,080	2,720	4,340	3,080	1,320	830	830
10	......	9,760	6,900	2,560	2,250	3,080	2,560	3,900	3,080	1,210	830	830
11	920	9,760	5,500	2,400	2,250	3,080	2,560	3,900	3,080	1,210	830	830
12	920	5,240	4,780	2,100	2,250	2,900	2,560	5,000	3,080	1,210	740	830
13	920	3,680	4,120	2,100	2,100	2,900	2,400	4,560	3,480	1,210	740	830
14	920	2,900	3,480	1,960	2,100	2,900	2,400	4,120	3,480	1,210	740	830
15	920	2,400	3,080	1,960	2,100	3,280	2,400	3,900	3,080	1,210	740	2,100
16	920	2,100	3,080	1,960	2,100	3,680	2,560	3,900	2,720	1,110	740	1,680
17	1,560	1,820	3,080	2,100	2,100	3,900	2,900	5,000	2,400	1,110	740	1,210
18	1,560	2,100	2,900	8,440	2,100	3,900	2,900	10,500	2,100	1,110	740	1,210
19	1,440	2,100	2,900	14,900	2,100	4,560	3,480	13,000	2,100	1,010	740	1,010
20	1,110	3,080	2,400	9,420	1,820	5,000	3,900	11,200	1,960	920	740	920
21	920	13,700	2,250	5,500	1,820	5,000	3,900	7,800	1,680	920	740	920
22	920	13,700	2,100	4,560	1,960	5,500	4,120	7,200	1,680	920	740	830
23	920	21,700	2,560	3,680	1,960	6,320	4,560	6,320	1,680	920	660	740
24	830	7,800	3,900	3,680	1,820	5,000	5,000	5,500	1,440	920	660	740
25	830	6,600	3,480	5,000	1,820	3,900	5,500	5,000	1,440	920	660	740
26	830	5,000	2,900	3,900	1,680	3,900	6,320	3,900	1,440	920	660	1,110
27	830	4,560	2,900	2,900	1,680	4,340	3,900	3,280	2,100	920	660	1,110
28	830	6,320	2,720	2,900	1,680	4,560	3,280	2,900	2,100	920	660	920
29	740	10,800	2,900	2,250	......	5,000	3,280	3,480	2,100	830	660	920
30	740	9,760	3,280	2,560	......	6,320	3,280	4,120	2,100	830	660	920
31	740	......	2,900	3,280	......	7,200	......	4,340	......	830	660	......

NOTE.—Discharge determined from a rating curve well defined between 800 and 6,000 second-feet.

Monthly discharge of North Fork of Santiam River at Mehama, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October 11-31	1,560	740	967	40,300	A.
November	21,700	740	5,670	337,000	B.
December	17,500	2,100	5,260	323,000	B.
January	14,900	1,960	3,660	225,000	A.
February	4,340	1,680	2,390	133,000	A.
March	7,200	1,440	3,680	226,000	A.
April	6,320	2,400	3,680	219,000	A.
May	13,000	2,900	5,320	327,000	A.
June	3,900	1,440	2,600	155,000	A.
July	1,960	830	1,200	73,800	A.
August	830	660	749	46,100	A.
September	2,100	660	985	58,600	A.
The period	....	....	....	2,160,000	

SANTIAM RIVER AT JEFFERSON, OREG.

Location.—In the NE. ¼ sec. 11, T. 10 S., R. 3 W., at the Southern Pacific Railroad bridge in Jefferson, about 2½ miles below the junction of the North and South forks, and about 9 miles above the mouth.

Records available.—July 19, 1905, to July 1, 1906; May 15, 1908, to September 30, 1911.

Drainage area.—1,890 square miles.

Gage.—Vertical staff on right bank.

Channel.—Rock and coarse gravel; practically permanent.

Discharge measurements.—Made from Southern Pacific Railroad bridge or from the highway bridge just below it.

Diversions.—The Albany power canal diverts from South Fork of Santiam River near Lebanon; the Salem power canal, from North Fork of Santiam River near Stayton, and water is diverted from North Fork for irrigation near West Stayton.

Cooperation.—Gage readings furnished by S. A. Pease, of Jefferson Mill Co.

Estimates withheld for additional data.

Discharge measurements of Santiam River at Jefferson, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 13	F. C. Ebert	1.09	1,280	May 21	Charles Leidl	4.95	14,600

Daily gage height, in feet, of Santiam River at Jefferson, Oreg., for the year ending Sept. 30, 1911.

[S. A. Pease, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.6	0.6	6.4	3.3	4.4	2.2	4.3	2.8	3.6	2.1	0.8	0.6
2	.8	.6	5.5	3.3	5.0	2.0	......	2.9	3.5	1.9	.7	.6
3	.9	.6	7.4	3.1	4.6	2.0	3.8	3.6	3.4	1.8	.7	.7
4	3.1	.8	8.0	3.0	4.0	2.0	3.7	3.7	3.2	1.7	.7	.8
5	2.5	.8	7.0	3.0	4.0	......	3.2	4.0	2.9	1.7	.7	.9
6	2.4	.7	6.0	3.0	3.9	2.5	3.1	4.0	2.8	1.5	.7	2.1
7	2.3	1.2	5.4	3.0	3.6	2.7	3.1	3.8	2.7	1.4	.7	1.8
8	2.2	6.4	5.1	3.0	3.4	3.1	3.2	3.4	2.7	1.4	.7	1.2
9	1.0	5.4	6.1	3.0	3.0	3.1	......	3.7	2.7	......	.6	1.0
10	1.1	6.4	5.4	3.5	3.0	3.2	3.2	3.7	2.7	1.2	.6	1.0
11	1.0	7.8	5.0	3.6	3.5	3.2	3.1	3.4	......	1.1	.6	1.0
12	1.0	5.0	4.5	3.4	......	3.3	3.0	3.4	2.9	1.1	.6	.9
13	1.1	3.9	4.0	3.1	3.8	3.3	2.9	3.4	2.8	1.1	......	.9
14	1.1	3.4	3.7	2.8	3.7	3.2	2.8	......	2.8	1.1	.6	1.1
15	1.0	3.0	3.4	......	3.4	3.4	2.7	3.6	2.6	1.1	.6	.9
16	.9	2.6	3.2	2.6	3.0	3.8	2.8	3.5	2.5	1.0	.6	.9
17	.9	2.6	3.9	2.6	2.7	3.8	3.0	3.7	2.5	1.0	.6	1.2
18	1.6	2.6	3.7	7.0	3.4	3.7	3.2	5.0	2.2	1.0	.6	1.5
19	1.5	2.7	3.3	9.5	......	3.8	3.5	7.0	2.1	1.0	.6	1.3
20	1.3	2.7	3.0	7.2	3.2	3.8	3.4	6.0	2.1	1.0	......	1.2
21	1.1	6.4	3.0	5.8	3.1	4.0	3.4	4.9	2.0	1.0	.6	1.0
22	1.0	7.0	2.9	......	3.0	4.0	3.6	4.8	1.9	1.0	.6	1.0
23	1.0	8.8	2.7	5.5	2.9	4.2	3.7	4.5	2.0	......	.6	.9
24	.9	7.0	2.6	5.3	2.7	4.5	3.6	4.2	2.0	.9	.6	.9
25	.8	5.6	3.3	4.0	2.6	4.4	3.7	3.8	......	.9	.6	.9
26	.7	4.7	3.5	4.0	......	......	3.7	3.6	2.1	.9	.6	.9
27	.7	4.5	3.6	3.6	2.4	3.6	3.5	3.5	2.5	.9	......	.9
28	.6	5.0	3.3	3.5	2.3	3.2	3.4	3.0	2.1	.8	.6	1.5
29	.6	7.3	3.2	3.1	......	3.3	3.2	3.0	1.9	.8	.6	1.2
30	......	7.7	3.1	3.3	......	3.4	3.1	3.0	2.0	.7	.6	1.1
31	.6	......	3.2	4.0	......	3.8	......	3.5	......	.8	.6	......

NOTE.—Gage height of June 27, 1911, affected by backwater from logs on the control.

MARION FORK OF SANTIAM RIVER AT MARION LAKE, NEAR HOOVER, OREG.

Location.—In the NE. ¼ sec. 6, T. 12 S., R. 8 E., at the outlet of Marion Lake, 28 miles above Hoover.

Records available.—February 23, 1907, to September 30, 1911; fragmentary.

Drainage area.—26 square miles.

Gage.—Vertical staff.

Channel.—Rocky; somewhat shifting.

Discharge measurements.—Made by wading at gage.

Accuracy.—Results fair.

Cooperation.—Gage record furnished by J. G. Kelley, of Portland, Oreg.

Discharge measurements of Marion Fork of Santiam River at Marion Lake, near Hoover, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 7	F. C. Ebert	0.88	85	June 22	R. W. Davenport	1.15	130

Daily gage height, in feet, of Marion Fork of Santiam River at Marion Lake, near Hoover, Oreg., for the year ending Sept. 30, 1911.

[Jack Hamlyn, observer.]

Date.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.86	0.85	1.25	0.88	0.88	0.79	0.88	1.02	1.35	1.10	0 75	0.67
2	.88	.88	1.38	.90	.92	.77	.85	1.05	1.40	1.10	.71	.67
3	1.40	.88	1.50	.90	.92	.79	......	1.10	1.50	1.10	.71	.67
4	1.38	.88	1.54	.92	.92	.79	......	1.15	1.60	1.10	.70	.70
5	1.24	.88	1.46	.92	.92	.79	.92	1.25	1.65	1.10	.71	.71
6	1.10	.88	1.29	.92	.90	......	.92	1.25	1.70	1.05	.69	.73
7	.88	1.00	1.25	.88	.88	......	.88	1.20	1.75	1.00	.67	.77
8	......	1.05	1.25	.88	.88	.79	.88	1.25	1.85	.99	.67	.77
9	......	1.42	1.25	.88	.85	.79	.88	1.25	1.85	.96	.67	.77
10	......	1.62	1.21	.90	.88	.79	.88	1.20	1.90	.93	.67	.77
11	.90	1.83	1.17	.88	.88	.81	.88	1.10	1.90	.89	.67	.75
12	.98	1.54	1.12	.88	.88	.81	.85	1.10	1.95	.88	.67	.73
13	......	1.33	1.10	.90	.88	.83	.88	1.05	1.85	.84	.67	.73
14	......	1.25	1.08	.92	.88	.83	.92	1.05	1.70	.84	.67	.73
15	......	1.12	1.04	.92	.85	.81	.90	1.02	1.60	.82	.67	.76
16	......	1.08	1.00	.88	.85	.81	.88	1.05	1.50	.79	.67	.77
17	......	1.08	1.00	.88	.88	.79	.85	1 10	1.40	.78	.67	.78
18	......	1.00	.96	.94	.88	79	.83	1.20	1.40	.79	.67	.79
19	1.00	1.00	.92	1.00	.90	.79	.83	1.25	1.30	.76	.67	.79
20	.96	1.17	.92	1.00	.88	.79	.83	1 25	1.25	.75	.67	......
21	.96	1.33	.92	.96	.88	.81	.83	1.30	1.15	.75	.67	......
22	.96	1 46	.92	.92	.85	.83	.88	......	1.05	.74	.67	......
23	.96	1.71	.90	.92	.85	.85	.92	1.15	1.10	.73	.67	......
24	.96	1.54	.88	.92	.83	.88	.96	1.15	1.10	.71	.67	......
25	.96	1.42	......	.92	.83	.92	1.00	1.10	1.10	.70	.67	.71
26	.92	1.33	......	.92	.83	.92	1.00	1.10	1.04	.71	.67	.73
27	.92	1.21	......	.90	.81	.88	.98	1.05	1.10	.72	.67	.75
28	.92	1.25	.88	.90	.79	.85	.98	1.05	1.10	.76	.67	.75
29	.88	1.33	.88	.88	......	.85	......	1.10	1.10	.73	.67	.73
30	.88	1.33	.88	.88	......	.88	1.00	1.10	1.10	.72	.67	.73
31	.88	......	.88	.88	......	.88	......	1.20	......	.75	.67	......

Daily discharge, in second-feet, of Marion Fork of Santiam River at Marion Lake, near Hoover, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	82	76	137	77	77	62	77	104	175	120	56	46
2	84	79	160	80	84	59	72	110	186	120	50	46
3	161	79	183	80	84	62	76	120	210	120	50	46
4	158	79	191	84	84	62	80	131	234	120	49	49
5	135	79	175	84	84	62	84	153	247	120	50	50
6	114	79	144	84	80	62	84	153	260	110	48	53
7	84	96	137	77	77	62	77	142	273	100	46	59
8	84	104	137	77	77	62	77	153	299	98	46	59
9	85	168	137	77	72	62	77	153	299	92	46	59
10	86	207	130	80	77	62	77	142	312	86	46	59
11	87	253	123	77	77	65	77	120	312	78	46	56
12	97	191	114	77	77	65	72	120	325	77	46	53
13	97	151	111	80	77	68	77	110	299	70	46	53
14	97	137	108	84	77	68	84	110	260	70	46	53
15	97	114	102	84	72	65	80	104	234	66	46	57
16	96	108	96	77	72	65	77	110	210	62	46	59
17	96	108	96	77	77	62	72	120	186	60	46	60
18	96	96	90	88	77	62	68	142	186	62	46	62
19	96	96	85	100	80	62	68	153	164	57	46	62
20	90	123	85	100	77	62	68	153	153	56	46	60
21	90	151	85	92	77	65	68	164	131	56	46	58
22	90	175	85	84	72	68	77	148	110	55	46	56
23	90	226	82	84	72	72	84	131	120	53	46	54
24	90	191	79	84	68	77	92	131	120	50	46	52
25	90	168	79	84	68	84	100	120	120	49	46	50
26	85	151	79	84	68	84	100	120	108	50	46	53
27	85	130	79	80	65	77	96	110	120	52	46	56
28	85	137	79	80	62	72	96	110	120	57	46	56
29	79	151	79	77	....	72	98	120	120	53	46	53
30	79	151	79	77	....	77	100	120	120	52	46	53
31	79	....	79	77	....	77	....	142	....	56	46	....

NOTE.—Discharge determined from two rating curves well defined between 50 and 200 second-feet. Discharge interpolated for days when no gage height was reported.

Monthly discharge of Marion Fork of Santiam River at Marion Lake, near Hoover, Oreg., for the year ending Sept. 30, 1911.

[Drainage area, 26 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	161	79	95.6	3.68	4.24	5,880	A.
November	253	76	135	5.19	5.79	8,030	B.
December	191	79	110	4.23	4.88	6,760	B.
January	100	77	82.2	3.16	3.64	5,050	A.
February	84	62	75.4	2.90	3.02	4,190	A.
March	84	59	67.3	2.59	2.99	4,140	A.
April	100	68	81.2	3.12	3.48	4,830	A.
May	164	104	130	5.00	5.76	7,990	A.
June	325	108	200	7.69	8.58	11,900	B.
July	120	49	75.1	2.89	3.33	4,620	A.
August	56	46	46.9	1.80	2.08	2,880	B.
September	62	46	54.7	2.10	2.34	3,250	A.
The year	325	46	96.0	3.69	50.13	69,500	

NORTH FORK OF PUZZLE CREEK NEAR HOOVER, OREG.

Location.—In the NE. ¼ sec. 29, T. 11 S., R. 8 E., about 26 miles above Hoover.

Records available.—August 6, 1909, to September 30, 1911; fragmentary.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Rocky; control is remains of an old weir, which may shift slightly.

Discharge measurements.—Made by wading near gage.

Accuracy.—Results fair.

Cooperation.—Gage record furnished by J. G. Kelley, of Portland, Oreg.

Discharge measurements of North Fork of Puzzle Creek near Hoover, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 7	F. C. Ebert............	0.86	9.3	June 21	R. W. Davenport......	1.21	24.5

Daily gage height, in feet, of North Fork of Puzzle Creek near Hoover, Oreg., for the year ending Sept. 30, 1911.

[Jack Hamlyn, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.86	0.80	0.88	0.84	0.88	0.80	0.84	0.94	1.44	1.14	0.92	0.84
2	.86	.80	.88	.84	.88	.80	......	.96	1.48	1.13	.90	.84
3	.84	.80	1.04	.82	.86	.80	......	1.00	1.52	1.12	.90	.84
4	.84	.80	1.00	.82	.84	.82	......	1.04	1.60	1.16	.90	.86
5	.84	.80	.96	.82	.84	......	......	1.06	1.64	1.21	.88	.90
6	.84	.80	.90	.82	.84	......	.86	1.04	1.68	1.18	.88	.90
7	.86	.84	.88	.82	.82	......	.86	1.04	1.66	1.14	.86	.90
8	......	.92	.88	.82	.82	......	.86	1.08	1.70	1.09	.87	.90
9	......	1.18	.88	.82	.84	.82	.88	1.04	1.76	1.04	.88	.90
10	......	1.44	.86	.82	.84	.84	.88	1.00	1.78	1.02	.88	.90
11	......	1.04	.86	.84	.84	.86	.86	.94	1.72	.99	.88	.88
12	.86	.86	.86	.84	.84	.86	.86	.92	1.66	.98	.88	.86
13	.84	.86	.86	.84	.84	.86	.86	.92	1.58	.98	.88	.84
14	.82	.84	.86	.84	.86	.86	.86	.90	1.50	.99	.88	.84
15	.82	.84	.86	.84	.86	.84	.86	.90	1.44	1.00	.88	.86
16	.82	.82	.84	.84	.86	.84	.86	.90	1.38	1.02	.88	.86
17	.82	.82	.84	.84	.86	.84	.84	.94	1.30	.98	.88	.86
18	.82	.82	.84	.88	.86	.84	.84	1.00	1.28	.96	.88	.86
19	.80	.82	.84	.92	.84	.84	.84	1.04	1.22	.96	.88	.86
20	.80	.90	.84	.88	.84	.84	.86	1.06	1.20	.96	.88	......
21	.80	1.00	.84	.88	.84	.82	.86	......	1.18	.94	.88	......
22	.80	1.06	.84	.86	.84	.84	.86	......	1.14	.95	.88	......
23	.82	1.00	.84	.84	.84	.84	.88	......	1.12	.94	.86	......
24	.80	.94	.84	.84	.82	.86	.90	1.02	1.14	.92	.86	......
25	.80	.92	......	.84	.82	.88	.90	1.02	1.10	.92	.86	.84
26	.80	.92	......	.84	.82	.88	.90	1.00	1.08	.92	.86	.84
27	.80	.90	......	.86	.82	.86	.90	1.02	1.16	.92	.86	.82
28	.80	.90	......	.88	.80	.84	......	1.04	1.16	.92	.86	.84
29	.80	.90	.84	.88	......	.84	......	1.10	1.16	.92	.86	.82
30	.80	.88	.84	.88	......	.84	......	1.22	1.14	.92	.84	.82
31	......	......	.84	.88	......	.84	......	1.38	......	.92	.84	......

Daily discharge, in second-feet, of North Fork of Puzzle Creek near Hoover, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	8.8	7.0	9.4	8.2	9.4	7.0	8.2	11	40	21	11	8.2
2	8.8	7.0	9.4	8.2	9.4	7.0	8.3	12	43	20	10	8.2
3	8.2	7.0	16	7.6	8.8	7.0	8.4	14	47	20	10	8.2
4	8.2	7.0	14	7.6	8.2	7.6	8.6	16	53	22	10	8.8
5	8.2	7.0	12	7.6	8.2	7.6	8.7	17	57	25	9.4	10
6	8.2	7.0	10	7.6	8.2	7.6	8.8	16	60	23	9.4	10
7	8.8	8.8	9.4	7.6	7.6	7.6	8.8	16	58	21	8.8	10
8	8.8	12	9.4	7.6	7.6	7.6	8.8	17	62	18	9.1	10
9	8.8	30	9.4	7.6	8.2	7.6	9.4	16	68	16	9.4	10
10	8.8	72	8.8	7.6	8.2	8.2	9.4	14	70	15	9.4	10
11	8.8	24	8.8	8.2	8.2	8.8	8.8	11	64	13	9.4	9.4
12	8.8	10	8.8	8.2	8.2	8.8	8.8	11	58	13	9.4	8.8
13	8.2	8.8	8.8	8.2	8.2	8.8	8.8	11	51	13	9.4	8.2
14	7.6	8.2	8.8	8.2	8.8	8.8	8.8	10	45	13	9.4	8.2
15	7.6	8.2	8.8	8.2	8.8	8.2	8.8	10	40	14	9.4	8.8
16	7.6	7.6	8.2	8.2	8.8	8.2	8.8	10	36	15	9.4	8.8
17	7.6	7.6	8.2	8.2	8.8	8.2	8.2	11	30	13	9.4	8.8
18	7.6	7.6	8.2	9.4	8.8	8.2	8.2	14	29	12	9.4	8.8
19	7.0	7.6	8.2	11	8.2	8.2	8.2	16	25	12	9.4	8.8
20	7.0	10	8.2	9.4	8.2	8.2	8.8	17	24	12	9.4	8.7
21	7.0	14	8.2	9.4	8.2	7.6	8.8	17	23	11	9.4	8.6
22	7.0	17	8.2	8.8	8.2	8.2	8.8	16	21	12	9.4	8.5
23	7.0	14	8.2	8.2	8.2	8.2	9.4	15	20	11	8.8	8.4
24	7.0	11	8.2	8.2	7.6	8.8	10	15	21	11	8.8	8.3
25	7.0	11	8.2	8.2	7.6	9.4	10	15	18	11	8.8	8.2
26	7.0	11	8.2	8.2	7.6	9.4	10	14	17	11	8.8	8.2
27	7.0	10	8.2	8.8	7.6	8.8	10	15	22	11	8.8	7.6
28	7.0	10	8.2	9.4	7.0	8.2	10	16	22	11	8.8	8.2
29	7.0	10	8.2	9.4	....	8.2	11	18	22	11	8.8	7.6
30	7.0	9.4	8.2	9.4	....	8.2	11	25	21	11	8.2	7.6
31	7.0	....	8.2	9.4	....	8.2	....	36	....	11	8.2	....

NOTE.—Discharge determined from a rating curve well defined below 37 second-feet. Discharge interpolated for days when no gage height was reported.

Monthly discharge of North Fork of Puzzle Creek near Hoover, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	8.8	7.0	7.75	477	B.
November	72	7.0	12.7	756	B.
December	16	8.2	9.13	561	B.
January	11	7.6	8.45	520	B.
February	9.4	7.0	8.24	458	B.
March	9.4	7.0	8.14	501	B.
April	11	8.2	9.09	541	B.
May	36	10	15.2	935	B.
June	70	17	38.9	2,310	C.
July	25	11	14.6	898	B.
August	11	8.2	9.27	570	B.
September	10	7.6	8.73	519	B.
The year	72	7.0	10.0	9,050	

SOUTH FORK OF PUZZLE CREEK NEAR HOOVER, OREG.

Location.—In the SE. ¼ sec. 29, T. 11 S., R. 8 E., half a mile above the junction of the North and South forks and about 26 miles above Hoover.

Records available.—August 6, 1909, to September 30, 1911; fragmentary.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Rocky; control is remains of an old weir; somewhat shifting.

Discharge measurements.—Made by wading near gage.

Accuracy.—Results fair.

Cooperation.—Gage record furnished by J. G. Kelley, of Portland, Oreg.

Discharge measurements of South Fork of Puzzle Creek near Hoover, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 7	F. C. Ebert............	0.88	16.2	June 21	R. W. Davenport......	1.12	29.2

Daily gage height, in feet, of South Fork of Puzzle Creek near Hoover, Oreg., for the year ending Sept. 30, 1911.

[Jack Hamlyn, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.94	0.80	0.86	0.82	0.84	0.78	0.70	0.72	0.94	1.11	1.10	1.10
2	.96	.80	.86	.82	.82	.78	....	.74	1.04	1.12	1.10	1.10
3	.96	.80	.92	.80	.82	.78	....	.78	1.08	1.12	1.10	1.08
4	.96	.80	.90	.80	.80	.78	....	.80	1.14	1.14	1.08	1.08
5	.94	.80	.88	.80	.80	....	....	.84	1.16	1.17	1.08	1.08
6	.92	.80	.86	.80	.80	....	.70	.84	1.20	1.16	1.08	1.08
7	.88	.84	.86	.80	.80	....	.70	.84	1.24	1.14	1.10	1.08
8	....	.92	.86	.80	.80	....	.70	.86	1.24	1.15	1.13	1.08
9	....	1.18	.84	.80	.80	.74	.70	.84	1.24	1.10	1.12	1.08
10	....	1.44	.84	.80	.82	.74	.70	.82	1.26	1.10	1.14	1.08
11	....	1.04	.84	.80	.82	.74	.70	.76	1.22	1.11	1.14	1.06
12	.92	.86	.82	.80	.84	.74	.70	.72	1.20	1.10	1.14	1.04
13	.88	.84	.82	.82	.84	.74	.72	.70	1.16	1.08	1.14	1.04
14	.88	.84	.82	.82	.84	.74	.72	.70	1.14	1.09	1.14	1.04
15	.88	.84	.82	.82	.82	.72	.72	.70	1.12	1.12	1.14	1.06
16	.86	.80	.82	.82	.82	.72	.72	.72	1.12	1.14	1.14	1.06
17	.84	.80	.82	.82	.82	.70	.70	.74	1.10	1.12	1.14	1.06
18	.84	.80	.82	.84	.82	.70	.70	.78	1.10	1.12	1.14	1.06
19	.84	.80	.82	.86	.82	.70	.70	.82	1.08	1.14	1.14	1.04
20	.82	.86	.82	.84	.80	.72	.70	.84	1.08	1.12	1.14	....
21	.82	.96	.82	.82	.80	.70	.70	....	1.08	1.12	1.14	....
22	.82	.98	.82	.82	.80	.70	.70	....	1.08	1.12	1.14	....
23	.82	.98	.82	.80	.80	.70	.70	....	1.06	1.12	1.12	....
24	.80	.90	.82	.80	.80	.70	.72	.84	1.10	1.12	1.12	....
25	.80	.90	....	.80	.78	.72	.74	.82	1.08	1.14	1.12	1.02
26	.80	.88	....	.80	.78	.72	.74	.80	1.08	1.14	1.12	1.02
27	.80	.84	....	.80	.78	.70	.72	.80	1,12	1.14	1.12	1.02
28	.80	.86	....	.82	.78	.70	....	.80	1.14	1.13	1.12	1.04
29	.80	.86	.82	.84	....	.70	....	.80	1.12	1.12	1.12	1.02
30	.80	.86	.82	.84	....	.70	....	.84	1.10	1.12	1.10	1.02
31	.80	....	.82	.84	....	.70	....	.86	....	1.11	1.10	....

Daily discharge, in second-feet, of South Fork of Puzzle Creek near Hoover, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	17	11	13	12	13	10	8.0	8.6	17	29	28	28
2	19	11	13	12	12	10	8.0	9.2	24	30	28	28
3	19	11	16	11	12	10	8.0	10	27	30	28	27
4	19	11	15	11	11	10	8.0	11	31	31	27	27
5	17	11	14	11	11	10	8.0	13	33	34	27	27
6	16	11	13	11	11	9.8	8.0	13	36	33	27	27
7	14	13	13	11	11	9.6	8.0	13	40	31	28	27
8	14	16	13	11	11	9.4	8.0	13	40	32	30	27
9	15	34	13	11	11	9.2	8.0	13	40	28	30	27
10	15	59	13	11	12	9.2	8.0	12	41	28	31	27
11	16	24	13	11	12	9.2	8.0	9.8	38	29	31	25
12	16	13	12	11	13	9.2	8.0	8.6	36	28	31	24
13	14	13	12	12	13	9.2	8.6	8.0	33	27	31	24
14	14	13	12	12	13	9.2	8.6	8.0	31	27	31	24
15	14	13	12	12	12	8.6	8.6	8.0	30	30	31	25
16	13	11	12	12	12	8.6	8.6	8.6	30	31	31	25
17	13	11	12	12	12	8.0	8.0	9.2	28	30	31	25
18	13	11	12	13	12	8.0	8.0	10	28	30	31	25
19	13	11	12	13	12	8.0	8.0	12	27	31	31	24
20	12	13	12	13	11	8.6	8.0	13	27	30	31	24
21	12	19	12	12	11	8.0	8.0	13	27	30	31	23
22	12	20	12	12	11	8.0	8.0	13	27	30	31	23
23	12	20	12	11	11	8.0	8.0	13	25	30	30	23
24	11	15	12	11	11	8.0	8.6	13	28	30	30	22
25	11	15	12	11	10	8.6	9.2	12	27	31	30	22
26	11	14	12	11	10	8.6	9.2	11	27	31	30	22
27	11	13	12	11	10	8.0	8.6	11	30	31	30	22
28	11	13	12	12	10	8.0	8.6	11	31	30	30	24
29	11	13	12	13	....	8.0	8.6	11	30	30	30	22
30	11	13	12	13	....	8.0	8.6	13	28	30	28	22
31	11	....	12	13	....	8.0	....	13	....	29	28	....

NOTE.—Discharge determined from a fairly well defined rating curve. Discharge interpolated for days when no gage height was reported.

Monthly discharge of South Fork of Puzzle Creek near Hoover, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	19	11	13.8	848	B.
November	59	11	15.9	946	C.
December	16	12	12.5	769	B.
January	13	11	11.7	719	C.
February	13	10	11.5	639	C.
March	10	8.0	8.81	542	C.
April	9.2	8.0	8.26	492	C.
May	13	8.0	11.1	682	B.
June	41	17	30.6	1,820	B.
July	34	27	30.0	1,840	B.
August	31	27	29.7	1,830	B.
September	28	22	24.7	1,470	B.
The year	59	8.0	17.4	12,600	

BREITENBUSH CREEK NEAR DETROIT, OREG.

Location.—In sec. 2, T. 10 S., R. 5 E., 300 feet below French Creek, 1½ miles from Detroit by trail, and 2½ miles above the mouth.

Records available.—October 10, 1910, to September 30, 1911; fragmentary.

Drainage area.—Not measured.

Gage.—Vertical staff on left bank.

Channel.—Gravel and large bowlders; practically permanent.

Discharge measurements.—Made from cable three-fourths of a mile above the gage and above French Creek, the discharge of which is measured or estimated and added to give the flow past the gage.

Accuracy.—Results fair.

Discharge measurements of Breitenbush Creek near Detroit, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 10	F. C. Ebert	2.02	193	Mar. 3	B. F. Heintzleman	2.27	245
				Apr. 19	do	3.07	558
1911.				June 20	R. W. Davenport	2.75	460
Jan. 15	B. F. Heintzleman	2.50	314	July 12	B. F. Heintzleman	2.40	274

Daily gage height, in feet, of Breitenbush Creek near Detroit, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1		1.9										
2				2.6		2.3			3.0			
3			5.2		2.8	2.25						
4												
5		1.9					3.2					
6			4.0					3.6			2.2	
7				2.5		2.5				2.5		2.0
8		3.8										
9					2.5							
10	2.0	4.7	3.7						3.4		1.9	
11						2.7						
12		3.4								2.4		
13				2.5								
14			3.1									1.9
15				2.5	2.4		2.8					
16			2.9								1.9	
17						3.4			3.1			
18		2.5						4.3				
19							3.1					
20			2.7	3.5		3.6			2.75	2.2		
21												1.9
22		4.4			2.4		3.3		2.7			
23			2.6								1.8	
24				2.8								
25	1.9	3.7				4.0						
26			2.8									
27								3.0				2.0
28												
29										2.1		
30		4.3					3.1		2.6			
31				2.9		4.0		3.2			1.8	

Daily discharge, in second-feet, of Breitenbush Creek near Detroit, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1		144										
2				356		247			555			
3			2,620		448	232						
4												
5		144					673					
6			1,260					935			217	
7				316		316				316		166
8		1,090										
9					316							
10	166	2,000	1,010						799		144	
11						400						
12		799								280		
13				316								
14			613									144
15				316	280		448					
16			500								144	
17						799			613			
18		316						1,560				
19							613					
20			400	865		935			424	217		
21												144
22		1,670			280		735		400			
23			356								124	
24				448								
25	144	1,010				1,260						
26			448									
27								555				166
28												
29										190		
30		1,560					613		356			
31				500		1,260		673			124	

NOTE.—Discharge determined from a rating curve well defined below 900 second-feet. Estimates of monthly discharge withheld on account of infrequency of gage-height observations.

SOUTH FORK OF SANTIAM RIVER NEAR CASCADIA, OREG.

Location.—In the NE. ¼ sec. 34, T. 13 S., R. 3 E., at the Cascadia ranger station, 3 miles above Cascadia, and about 12 miles above the junction of South and Middle forks.

Records available.—August 3, 1910, to August 15, 1911; fragmentary.

Drainage area.—Not measured.

Gage.—Vertical staff on left bank.

Channel.—Gravel and small bowlders; practically permanent.

Discharge measurements.—Made from cable near gage.

Accuracy.—Results good for low and medium stages.

Discharge measurements of South Fork of Santiam River near Cascadia, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 10	B. F. Heintzleman	3.26	312	July 7	B. F. Heintzleman	2.31	106
Apr. 24	.....do	3.79	482	8	.....do	2.29	103
24	.....do	3.78	470				

Daily gage height, in feet, of South Fork of Santiam River near Cascadia, Oreg., for the year ending Sept. 30, 1911.

[A. O. Knowles, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1			5.4	3.2	3.8	2.7		3.6			
2		1.7	4.9	3.1	3.7	2.7	3.5	3.7			
3			3.8	3.1	3.5	2.65	3.5	3.9	4.0		
4		1.8		3.1	3.4	2.6	3.4	3.8			
5			3.4	3.15		2.9	3.4	3.7			1.75
6			3.7	3.15	3.25	2.95	3.4	3.8			
7			4.2	3.15	3.1	3.0	3.6	3.9		2.3	
8			4.6	3.2	2.95	3.0	3.7	4.0	3.2		
9			4.4	3.4	3.05	3.1	3.6	3.9	3.0		
10			4.5	3.25	3.0	3.1	3.45	3.7	3.0	2.1	
11			4.4	3.15	3.2	3.1	3.3	3.8	3.2		
12			4.4	2.9	3.3	3.2	3.1	3.8	3.35		
13	2.15		4.35	2.8	3.35	3.15	3.05	3.8		1.9	
14			4.35	2.7	3.4	3.15	3.1	3.7			
15	2.0	2.85	4.2	2.6	3.25	3.2	3.2	3.8			1.7
16		2.5	4.15	2.5	3.0	3.2	3.1	4.0			
17	2.0	2.4	4.0	2.4	3.0	3.25	3.2	4.5			
18	1.9		3.8	6.1	3.2	3.3	3.25	6.0			
19			3.8	5.7	3.0	3.25	3.3	5.2			
20	1.85	5.6	4.0	5.4	2.95	3.2	3.4	4.8			
21	1.85		4.2	5.0	2.95	3.3	3.6	4.4		1.9	
22			4.0	3.5	2.9	3.3	3.7	4.2			
23		3.8	3.8	3.4	2.85	3.25	3.8	4.0			
24			3.6	3.2	2.85	3.4	3.8	3.8			
25	1.75	3.0	3.6		2.8	3.5	4.0	3.5		1.87	
26			3.6	3.1	2.8	3.45	3.8	3.5			
27			3.8	3.1	2.7	3.4	3.8				
28	1.7	8.5	3.7	3.1	2.7	3.4	3.9				
29			3.5	3.1		3.35	4.0	4.0	2.85		
30		7.2	3.4	3.0		3.3	3.6				
31			3.4			3.3					

Daily discharge, in second-feet, of South Fork of Santiam River near Cascadia, Oreg., for Aug. 3, 1910, to Sept. 30, 1911.

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1		34			1,280	297	480	176	354	415	550	182	44
2				37	964	270	447	176	384	447	550	169	43
3	32				480	270	384	166	384	514	550	156	42
4				45	417	270	354	156	354	480	499	143	41
5					354	284	332	221	354	447	448	130	41
6					447	284	311	233	354	480	397	117	41
7					628	284	270	245	415	514	347	104	40
8					808	297	233	245	447	550	297	94	40
9					714	354	258	270	415	514	245	85	40
10					760	311	245	270	369	447	245	76	39
11					714	284	297	270	325	480	297	68	39
12					714	221	325	297	270	480	340	61	38
13			82		692	198	340	284	258	480	333	54	38
14					692	176	354	284	270	447	326	54	37
15			64	210	628	156	311	297	297	480	319	54	37
16				137	608	137	245	297	270	550	312	54	
17			64	120	550	120	245	311	297	760	305	54	
18			54		480	1,850	297	325	311	1,760	298	54	
19					480	1,500	245	311	325	1,140	290	54	
20			50	1,420	550	1,280	233	297	354	910	282	54	
21			50		628	1,020	233	325	415	714	274	54	
22					550	384	221	325	447	628	266	54	
23				480	480	354	210	311	480	550	258	53	
24					415	297	210	354	480	480	250	52	
25		31	41	245	415	284	198	384	550	384	242	51	
26					415	270	198	369	480	384	234	50	
27					480	270	176	354	480	439	226	49	
28			37	4,840	447	270	176	354	514	494	218	48	
29					384	270		340	550	550	210	47	
30				3,040	354	245		325	415	550	196	46	
31					354	362		325		550		45	

NOTE.—Discharge determined from a rating curve well defined below 1,000 second-feet; above 1,500 second-feet the curve is only approximate, and values given for Mar. 28 and 30 may be subject to considerable error. Discharge interpolated for days between Dec. 1, 1910, and Aug. 15, 1911, when no gage height was reported. No attempt made to estimate discharge for missing days August to November, 1910.

Monthly discharge of South Fork of Santiam River near Cascadia, Oreg., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
December	1,280	354	577	35,500	A.
January	1,850	120	415	25,500	B.
February	480	176	280	15,600	A.
March	384	156	287	17,600	A.
April	550	258	387	23,000	A.
May	1,760	384	581	35,700	A.
June	550	196	320	19,000	B.
July	182	45	76.3	4,690	B.
August 1-15	44	37	40.0	1,190	C.
The period				178,000	

SOUTH FORK OF SANTIAM RIVER NEAR FOSTER, OREG.

Location.—In the NE. ¼ sec. 25, T. 13 S., R. 1 E., 300 feet above the junction of South and Middle forks, and 2 miles above Foster.

Records available.—August 6 to November 11, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Gravel and bowlders; shifting in floods.

Discharge measurements.—Made by wading.

Cooperation.—Gage record furnished by the Oregon Title & Trust Co., of Albany, Oreg.

Estimates withheld for additional data.

The following discharge measurements were made by Charles Leidl and R. C Pierce.

August 6, 1911: Gage height, 0.82 foot; discharge, 65.1 second-feet.

November 10, 1911: Gage height, 0.96 foot; discharge, 87 second-feet.

Daily gage height, in feet, of South Fork of Santiam River near Foster, Oreg., for 1911.

Day.	Aug.	Sept.	Oct.	Nov.	Day.	Aug.	Sept.	Oct.	Nov.
1		0.69	1.07	0.97	16	0.79	1.35	1.36	
2		.72	1.10	.97	17	.78	1.27	1.31	
3		1.22	1.13	.96	18	.77	1.17	1.25	
4		1.65	1.68	.95	19	.76	1.10	1.20	
5		2.75	1.50	1.02	20	.75	1.05	1.18	
6	0.82	1.65	1.45	1.60	21	.74	1.02	1.15	
7	.82	1.40	1.36	2.45	22	.73	1.00	1.11	
8	.82	1.05	1.30	2.8	23	.72	.93	1.10	
9	.82	1.49	1.35	3.2	24	.72	.95	1.09	
10	.82	1.37	1.44	2.30	25	.71	.92	1.07	
11	.82	1.15	1.40	2.10	26	.71	1.80	1.04	
12	.80	1.13	1.30		27	.70	1.50	1.01	
13	.80	1.10	1.30		28	.70	1.33	1.00	
14	.80	1.03	1.42		29	.70	1.20	.99	
15	.80	1.38	1.44		30	.69	1.16	.99	
					31	.69		.98	

SOUTH FORK OF SANTIAM RIVER AT WATERLOO, OREG.

Location.—In sec. 29, T. 12 S., R. 1 W., at Waterloo, 4 miles above Hamilton Creek, 6 miles above Lebanon, and about 20 miles above the mouth.

Records available.—July 28, 1905, to March 31, 1907; October 3, 1910, to September 30, 1911.

Drainage area.—640 square miles.

Gage.—Staff in two sections, the lower section inclined and the upper vertical, on right bank about half a mile below Waterloo Falls.

Channel.—Gravel and small bowlders; shifting in floods.

Discharge measurements.—Made from highway bridge or by wading.

Estimates withheld for additional data.

The following discharge measurement was made by B. F. Heintzleman:

October 24, 1910: Gage height, 0.92 foot; discharge, 293 second-feet.

Daily gage height, in feet, of South Fork of Santiam River at Waterloo, Oreg., for the year ending Sept. 30, 1911.

[P. D. McCarty, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	0.6	5.4	2.9	3.5	1.9	3.8	2.3	3.0	1.7	0.5	0.2
2	......	.6	4.9	2.7	3.9	1.8	3.6	2.5	2.9	1.4	.5	.2
3	1.8	.7	8.2	2.5	3.4	1.8	3.2	2.8	2.6	1.3	.5	.2
4	2.3	.9	7.3	2.7	3.3	1.9	3.1	3.1	2.4	1.2	.5	.6
5	2.0	.9	6.0	2.6	3.3	2.3	2.8	3.3	2.2	1.2	.5	1.1
6	1.7	.8	5.0	2.5	3.1	2.7	2.6	3.2	2.2	1.1	.5	2.1
7	1.2	1.4	4.1	2.4	2.9	2.9	2.4	2.9	2.1	1.1	.4	1.5
8	.9	6.3	4.0	2.5	2.7	2.9	2.4	2.9	2.1	1.0	.4	1.0
9	.8	4.2	4.9	2.7	2.6	2.9	2.4	3.1	2.0	1.0	.4	1.2
10	.7	4.9	4.4	2.9	2.6	3.0	2.9	3.2	1.9	.9	.4	1.2
11	.6	5.6	3.6	2.8	3.0	3.0	2.8	2.9	2.0	.9	.4	1.2
12	.6	3.8	3.4	2.6	2.8	3.1	2.7	3.0	2.0	.9	.4	1.2
13	1.0	2.9	3.2	2.4	3.2	2.9	2.5	3.6	1.9	.8	.4	1.2
14	.8	2.5	3.0	2.8	3.0	2.9	2.6	3.5	1.9	.8	.4	1.4
15	.6	2.2	2.7	2.1	2.7	3.2	2.7	3.3	1.8	.8	.4	1.6
16	.6	2.0	2.5	2.0	2.6	3.5	2.8	3.0	1.7	.7	.4	1.5
17	2.0	1.8	2.4	2.1	2.4	3.4	2.8	3.1	1.6	.7	.3	1.3
18	1.3	1.9	3.0	6.8	3.0	3.3	2.6	6.9	1.5	.6	.3	1.1
19	1.1	1.3	2.7	9.6	3.0	3.2	3.1	6.8	1.5	.6	.3	.9
20	1.0	2.3	2.5	5.8	2.8	3.6	2.9	5.4	1.4	.6	.3	.8
21	.9	5.6	2.4	4.8	2.6	3.7	2.9	3.9	1.3	.6	.3	.7
22	.8	6.3	2.3	3.8	2.6	3.6	3.1	3.6	1.3	.6	.3	.6
23	1.0	10.4	2.4	3.4	2.4	3.8	3.0	3.3	1.3	.6	.3	.5
24	.9	6.0	3.4	3.2	2.3	3.9	3.1	3.0	1.3	.6	.3	.5
25	.8	4.4	3.3	3.1	2.2	3.8	3.4	3.0	1.2	.6	.2	.7
26	.8	3.7	3.0	3.0	2.1	3.4	3.1	2.7	1.2	.6	.2	1.4
27	.8	3.4	2.9	2.8	2.0	3.0	2.8	2.6	1.2	.6	.2	1.8
28	.7	6.2	2.7	2.8	1.9	2.8	2.6	2.5	1.6	.6	.2	1.3
29	.7	8.3	2.6	2.7	......	2.7	2.4	2.4	1.6	.5	.2	1.1
30	.7	7.2	2.8	2.7	......	3.1	2.3	2.7	1.6	.5	.2	1.0
31	.7	......	3.0	3.7	......	3.5	......	2.8	......	.5	.2	......

MIDDLE FORK OF SANTIAM RIVER NEAR FOSTER, OREG.

Location.—In the SE. ¼ sec. 24, T. 13 S., R. 1 E., 400 feet above the mouth of Middle Fork, and 1½ miles above Foster.

Records available.—August 6 to November 13, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Gravel and bowlders; shifting in floods.

Discharge measurements.—Made by wading near gage.

Cooperation.—Gage-height record furnished by the Oregon Title & Trust Co., of Albany, Oreg.

Estimates withheld for additional data.

The following discharge measurements were made by Charles Leidl and R. C. Pierce:

August 6, 1911: Gage height, 0.72 foot; discharge, 131 second-feet.

October 30, 1911: Gage height, 0.80 foot; discharge, 164 second-feet.

Daily gage height, in feet, of Middle Fork of Santiam River near Foster, Oreg., for 1911.

Day	Aug.	Sept.	Oct.	Nov.	Day.	Aug.	Sept.	Oct.	Nov.
1	....	0.54	1.10	0.78	16	0.65	1.40	1.20	....
2	....	.60	1.60	.75	17	.65	1.40	1.10	....
3	....	.61	1.55	.74	18	.60	1.05	1.10	....
4	....	.92	1.60	.74	19	.62	1.00	1.10	....
5	....	1.40	1.50	.81	20	.60	.90	1.00	....
6	0.72	1.50	1.30	1.80	21	.65	.90	1.00	....
7	.62	1.10	1.10	3.6	22	.60	.85	.95	....
8	.68	.94	1.10	....	23	.62	.80	.92	....
9	.68	.95	1.10	3.3	24	.60	.80	.90	....
10	.64	1.10	1.50	2.30	25	.60	.76	.90	....
11	.68	.91	1.40	2.20	26	.60	1.30	.89	....
12	.73	.87	1.40	2.00	27	.58	1.50	.84	....
13	.65	.89	1.30	2.6	28	.56	1.20	.81	....
14	.62	.82	1.30	....	29	.55	1.10	.81	....
15	.68	1.05	1.30	....	30	.55	1.10	.80	....
					31	.54	....	.80	....

LUCKIAMUTE RIVER NEAR SUVER, OREG.

Location.—In sec. 18, T. 9 S., R. 4 W., just below Helmick bridge, 3 miles below the junction of the main forks, and 4 miles northwest of Suver.

Records available.—August 18, 1905, to October 31, 1911.

Drainage area.—233 square miles.

Gage.—Staff, in two sections; the lower section inclined, the upper vertical.

Channel.—Clean sand; shifting.

Discharge measurements.—Made from cable at the gage.

Accuracy.—Results good.

No discharge measurements made during the year.

Daily gage height, in feet, of Luckiamute River near Suver, Oreg., for Oct. 1, 1910, to Oct. 31, 1911

[Mrs. P. C. Bush, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	1.15	1.95	14.0	10.5	11.0	6.0	4.8	5.0	4.6	2.6	1.70	1.30	1.50
2	1.2	1.95	15.1	10.0	11.0	5.8	4.6	5.2	4.4	2.6	1.70	1.30	1.55
3	5.2	1.75	15.5	9.9	10.8	6.0	4.6	5.8	4.4	2.6	1.65	1.30	1.60
4	6.7	2.15	15.8	8.6	10.3	5.5	4.4	6.3	4.2	2.5	1.60	1.50	1.75
5	6.4	2.9	16.0	7.7	10.0	5.6	4.4	6.6	4.0	2.5	1.60	2.1	1.75
6	5.9	4.7	15.8	6.8	9.8	5.8	4.2	6.2	4.0	2.4	1.60	2.3	1.70
7	5.6	4.75	15.5	6.9	9.6	5.9	4.0	5.9	3.9	2.4	1.60	1.70	1.70
8	5.4	5.9	14.0	7.6	9.6	6.2	4.9	5.8	3.8	2.3	1.60	1.60	1.75
9	4.9	7.6	13.7	8.5	9.3	6.1	5.0	5.7	3.0	2.4	1.65	1.60	1.80
10	3.8	21.7	13.0	8.8	9.0	6.0	5.8	5.6	3.0	2.2	1.70	1.40	1.80
11	2.4	22.0	11.6	9.5	9.6	6.0	6.6	5.4	3.5	2.2	1.70	1.40	1.85
12	2.4	19.0	10.8	8.6	9.8	5.5	6.4	5.3	3.4	2.1	1.70	1.50	1.90
13	2.35	16.0	9.5	8.3	10.6	5.7	6.2	4.0	3.4	2.0	1.70	1.50	1.90
14	2.2	7.9	8.9	7.4	10.7	6.0	5.9	4.4	3.2	2.0	1.70	2.1	2.8
15	2.2	7.4	8.35	8.7	11.4	5.8	5.8	4.5	3.0	1.90	1.70	1.80	2.7
16	2.2	6.0	7.7	9.8	10.8	5.5	6.0	4.6	2.9	1.90	1.70	3.1	2.6
17	2.9	6.15	7.3	12.0	10.5	5.4	6.2	4.8	2.9	1.90	1.65	2.0	2.5
18	3.1	6.3	7.1	27.0	9.9	5.3	6.4	8.7	2.8	1.85	1.65	1.90	2.3
19	3.35	8.6	6.95	30.9	9.6	5.2	6.2	11.4	2.8	1.80	1.60	1.90	2.3
20	3.5	12.0	6.9	26.6	9.0	5.2	6.0	9.8	2.8	1.80	1.60	1.60	2.2
21	3.8	20.0	6.7	21.0	8.8	5.1	5.2	8.4	2.8	1.85	1.55	1.50	2.2
22	3.9	23.0	6.8	16.0	8.0	5.0	4.5	8.0	2.7	1.85	1.55	1.60	2.2
23	3.7	22.0	7.1	14.0	7.7	5.0	4.8	7.3	2.6	1.90	1.50	1.80	2.2
24	3.4	19.0	8.5	11.6	7.6	5.2	5.0	7.0	2.6	1.80	1.40	1.50	2.1
25	2.9	17.5	7.9	11.5	7.2	5.3	4.9	6.5	2.6	1.80	1.40	1.60	1.90
26	2.6	16.4	7.8	11.4	7.0	5.4	4.8	6.0	2.8	1.80	1.40	1.75	1.95
27	2.25	15.0	7.85	11.4	6.7	5.6	4.6	5.4	2.8	1.85	1.40	1.80	1.85
28	2.15	12.7	8.5	11.3	6.4	5.3	4.5	5.4	2.9	1.70	1.35	1.80	1.80
29	1.95	13.0	8.9	9.6	......	5.0	4.8	5.1	2.8	1.70	1.35	1.75	1.80
30	1.95	13.8	9.3	10.3	......	5.0	4.9	5.0	2.7	1.60	1.30	1.60	1.70
31	2.0	......	10.0	10.6	......	4.8	......	4.8	......	1.60	1.30	......	1.75

Daily discharge, in second-feet, of Luckiamute River near Suver, Oreg., for Oct. 1, 1910, to Oct. 31, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	53	111	2,480	1,560	1,680	645	455	485	425	173	91	62	76
2	56	111	2,810	1,440	1,680	610	425	515	397	173	91	62	80
3	515	95	2,930	1,420	1,630	645	425	610	397	173	87	62	83
4	768	128	3,020	1,140	1,510	560	397	698	371	163	83	76	95
5	715	206	3,080	960	1,440	575	397	750	345	163	83	124	95
6	628	440	3,020	785	1,400	610	371	680	345	153	83	143	91
7	575	448	2,930	802	1,350	628	345	628	332	153	83	91	91
8	545	628	2,480	940	1,350	680	470	610	319	143	83	83	95
9	470	940	2,390	1,120	1,290	662	485	592	218	153	87	83	99
10	319	5,190	2,200	1,180	1,220	645	610	575	218	133	91	69	99
11	153	5,320	1,830	1,330	1,350	645	750	545	280	133	91	69	103
12	153	4,110	1,630	1,140	1,400	560	715	530	267	124	91	76	107
13	148	3,080	1,330	1,080	1,580	592	680	345	267	115	91	76	107
14	133	1,000	1,200	900	1,610	645	628	397	242	115	91	124	195
15	133	900	1,090	1,160	1,780	610	610	411	218	107	91	99	184
16	133	645	960	1,400	1,630	560	645	425	206	107	91	230	173
17	206	671	880	1,930	1,560	545	680	455	206	107	87	115	163
18	230	698	840	7,780	1,420	530	715	1,160	195	103	87	107	143
19	260	1,140	811	9,970	1,350	515	680	1,780	195	99	83	107	143
20	280	1,930	802	7,570	1,220	515	645	1,400	195	99	83	83	133
21	319	4,490	768	4,900	1,180	500	515	1,100	195	103	80	76	133
22	332	5,770	785	3,080	1,020	485	411	1,020	184	103	80	83	133
23	306	5,320	840	2,480	960	485	455	880	173	107	76	99	133
24	267	4,110	1,120	1,830	940	515	485	820	173	99	69	76	124
25	206	3,580	1,000	1,800	860	530	470	732	173	99	69	83	107
26	173	3,220	980	1,780	820	545	455	645	195	99	69	95	111
27	138	2,780	990	1,780	768	575	425	545	195	103	69	99	103
28	128	2,120	1,120	1,760	715	530	411	545	206	91	66	99	99
29	111	2,200	1,200	1,350	......	485	455	500	195	91	66	95	99
30	111	2,420	1,290	1,510	......	485	470	485	184	83	62	83	91
31	115	......	1,440	1,580	......	455	......	455	......	83	62	......	95

Note.—Discharge determined from a rating curve well defined between 60 and 4,500 second-feet.

Monthly discharge of Luckiamute River near Suver, Oreg., for Oct. 1, 1910, to Oct. 31, 1911.

[Drainage area, 233 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	768	53	280	1.20	1.38	17,200	A.
November	5,770	95	2,130	9.14	10.20	127,000	A.
December	3,080	768	1,620	6.95	8.01	99,600	A.
January	9,970	785	2,240	9.61	11.08	138,000	A.
February	1,780	715	1,310	5.62	5.85	72,800	A.
March	680	455	567	2.43	2.80	34,900	A.
April	750	345	523	2.24	2.50	31,100	A.
May	1,780	345	688	2.95	3.40	42,300	A.
June	425	173	250	1.07	1.19	14,900	A.
July	173	83	121	.519	.60	7,440	A.
August	91	62	81.2	.348	.40	4,990	B.
September	230	62	94.3	.405	.45	5,610	A.
The year	9,970	53	822	3.53	47.86	596,000	
October	195	76	116	.498	.57	7,130	A.

SOUTH FORK OF YAMHILL RIVER AT SHERIDAN, OREG.

Location.—In sec. 35, T. 5 S., R. 6 W., at highway bridge in Sheridan, about 2 miles below Mill Creek.

Records available.—April 25, 1906, to June 30, 1909; August 3 to September 11, 1910; December 9, 1910, to September 30, 1911.

Drainage area.—290 square miles.

Gage.—Standard chain on bridge. Prior to December, 1910, a vertical staff on bridge piers.

Channel.—Sand and fine gravel; somewhat shifting.

Discharge measurements.—Made from the bridge at gage or by wading near the gage.

Accuracy.—Results good.

Discharge measurements of South Fork of Yamhill River at Sheridan, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 15	F. C. Ebert	0.52	134	Jan. 23	Ebert and Storey	4.90	2,280

Daily gage height, in feet, of South Fork of Yamhill River at Sheridan, Oreg., for the year ending Sept. 30, 1911.

[J. L. Morris, observer.]

Day.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	3.2	4.6	2.4	2.2	1.60	1.60	0.80	0.25	0.30
2	....	3.5	4.6	2.3	2.0	1.75	1.50	.85	.20	.35
3	....	3.6	4.6	2.2	1.80	2.0	1.50	.76	.15	.30
4	....	3.3	4.3	2.2	1.85	3.4	1.45	.75	.15	.30
5	....	3.1	4.0	2.2	1.80	3.0	1.40	.70	.20	1.10
6	....	3.0	4.0	2.4	1.70	3.0	1.35	.65	.20	.95
7	....	2.8	3.8	2.9	1.55	2.9	1.20	.60	.25	.70
8	....	2.6	3.8	3.0	1.40	2.8	1.15	.50	.20	.65
9	5.4	4.4	3.8	3.2	1.65	2.8	1.05	.50	.30	.55
10	5.1	4.0	3.8	3.2	2.8	2.7	.95	.55	.30	.40
11	4.3	3.7	3.8	3.0	3.0	2.6	.90	.50	.25	.60
12	3.9	3.1	4.7	3.0	3.0	2.6	.90	.45	.30	.70
13	3.5	2.9	6.0	2.9	3.0	2.6	.94	.40	.35	.65
14	3.2	2.6	5.3	2.7	2.9	2.6	.98	.40	.35	.55
15	3.0	2.5	5.0	2.6	2.8	2.6	.96	.45	.30	.60
16	2.6	3.7	4.2	2.8	2.7	2.9	1.00	.40	.20	.55
17	2.4	7.6	4.2	2.7	3.0	4.0	.98	.45	.35	.55
18	2.4	20.5	4.6	2.7	3.0	6.8	.96	.40	.30	.40
19	2.3	15.2	4.2	2.5	2.8	5.4	.95	.30	.30	.45
20	2.1	8.6	4.0	2.5	2.7	3.2	.80	.30	.25	.40
21	2.5	7.7	3.8	2.4	2.6	3.0	.60	.35	.15	.35
22	4.4	5.7	3.6	2.4	2.6	3.1	.65	.40	.20	.35
23	4.0	4.9	3.2	2.3	2.4	3.3	.60	.30	.05	.40
24	3.6	5.4	3.0	2.6	2.4	3.2	.75	.35	.05	.30
25	3.8	4.8	3.0	2.7	2.3	3.0	.70	.25	.15	.35
26	3.3	4.3	2.6	2.8	2.2	2.7	.85	.30	.25	.40
27	3.2	4.0	2.5	2.9	2.0	2.2	.70	.20	.10	.25
28	4.3	5.0	2.4	2.6	1.90	2.1	.65	.25	.20	.35
29	4.0	4.6	....	2.2	1.75	1.95	.55	.15	.35	.40
30	3.6	4.2	....	2.1	1.65	2.0	.70	.15	.35	.25
31	4.8	4.2	....	2.0	....	1.95	....	.20	.25	....

Daily discharge, in second-feet, of South Fork of Yamhill River at Sheridan, Oreg., for the year ending Sept. 30, 1911.

Day.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	1,100	2,130	686	603	384	384	178	76	84
2	....	1,300	2,130	644	524	433	354	189	69	92
3	....	1,370	2,130	603	450	524	354	170	62	84
4	....	1,160	1,890	603	468	1,230	340	168	62	84
5	....	1,040	1,660	603	450	980	327	157	69	249
6	....	980	1,660	686	416	980	314	147	69	212
7	....	875	1,510	925	369	925	275	137	76	157
8	....	775	1,510	980	327	875	262	118	69	147
9	2,820	1,970	1,510	1,100	400	875	236	118	84	128
10	2,560	1,660	1,510	1,100	875	825	212	128	84	100
11	1,890	1,440	1,510	980	980	775	200	118	76	157
12	1,580	1,040	2,220	980	980	775	200	109	84	147
13	1,300	925	3,390	925	980	775	210	100	92	137
14	1,100	775	2,640	825	925	775	219	100	92	137
15	980	730	2,470	775	875	775	214	109	84	128
16	775	1,440	1,810	875	825	925	224	100	69	128
17	686	5,020	1,810	825	980	1,660	219	109	92	128
18	686	20,800	2,130	825	980	4,190	214	100	84	100
19	644	14,200	1,810	730	875	2,820	212	84	84	109
20	563	6,110	1,660	730	825	1,100	178	84	76	100
21	730	5,120	1,510	686	775	980	137	92	62	92
22	1,970	3,100	1,370	686	775	1,040	147	100	69	92
23	1,660	2,380	1,100	644	686	1,160	137	84	48	100
24	1,370	2,820	980	775	686	1,100	168	92	48	84
25	1,510	2,300	980	825	644	980	157	76	62	92
26	1,160	1,890	775	875	603	825	189	84	76	100
27	1,100	1,660	730	925	524	603	157	69	55	76
28	1,890	2,470	686	775	486	563	147	76	69	92
29	1,660	2,130	....	603	433	505	128	62	92	100
30	1,370	1,810	....	563	400	524	157	62	92	76
31	2,300	1,810	....	524	....	505	....	69	76	....

Note.—Discharge determined from a rating curve well defined below 7,700 second-feet.

Monthly discharge of South Fork of Yamhill River at Sheridan, Oreg., for the year ending Sept. 30, 1911.

[Drainage area, 290 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
December 9-31	2,820	563	1,400	4.83	4.13	63,900	A.
January	20,800	730	2,970	10.2	11.76	183,000	A.
February	3,390	686	1,690	5.83	6.07	93,900	A.
March	1,100	524	783	2.70	3.11	48,100	A.
April	980	327	671	2.31	2.58	39,900	A.
May	4,190	384	1,010	3.49	4.02	62,100	A.
June	384	128	222	.766	.85	13,200	B.
July	189	62	109	.376	.43	6,700	B.
August	92	48	74.3	.256	.30	4,570	B.
September	249	76	117	.403	.45	6,960	B.
The period						522,000	

YAMHILL RIVER AT LA FAYETTE, OREG.

Location.—In sec. 7, T. 4 S., R. 3 W., at the Government locks, three-fourths of a mile below La Fayette, and about 8 miles above the mouth.

Records available.—1901 to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff attached to lower end of locks. Readings have also been made on a second gage in the backwater just above the locks and on a third gage at the county bridge at La Fayette.

Channel.—Gravel, sand, and mud; shifting in low water.

Discharge measurements.—Made from highway bridge at La Fayette, three-fourths of a mile above the locks, or by wading below the locks.

Cooperation.—Gage-height record furnished by the United States Engineer Corps.

Estimates withheld for additional data.

Discharge measurements of Yamhill River at La Fayette, Oreg., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 16	F. C. Ebert	3.95	258	May 30	E. S. Fuller	8.92	894

Daily gage height, in feet, of Yamhill River at La Fayette, Oreg., for the year ending Sept. 30, 1911.

[N. Nelson, observer. Gage below locks.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.8	3.4	27.5	14.9	15.4	9.3	9.9	8.0	8.8	5.8	3.4	2.6
2	2.9	3.4	28.0	14.0	16.7	8.7	10.4	8.0	9.2	5.8	3.4	2.6
3	3.5	3.5	26.0	12.8	16.7	8.7	10.4	8.3	9.0	5.8	3.4	2.6
4	8.2	3.5	27.5	12.2	16.7	8.4	9.9	9.0	8.7	5.6	3.4	2.7
5	7.9	3.5	28.2	11.8	14.9	8.4	9.5	10.7	8.4	5.4	3.4	3.2
6	7.5	3.5	26.9	11.4	15.2	9.0	8.9	10.8	8.0	5.0	3.4	3.6
7	6.3	3.7	23.2	11.7	15.0	9.4	8.5	10.7	7.7	4.9	3.0	5.1
8	4.6	8.9	20.2	10.4	14.3	10.3	8.0	10.2	7.6	4.8	3.3	5.7
9	4.5	11.5	19.7	10.7	13.6	10.7	7.8	10.0	7.5	4.8	3.3	4.8
10	4.3	17.7	18.9	13.2	13.9	10.8	8.4	10.2	7.4	4.7	3.3	4.1
11	4.0	25.8	17.9	13.9	13.7	10.8	10.5	10.1	8.5	4.6	3.2	4.1
12	3.9	22.3	16.2	13.9	14.2	10.8	11.9	9.9	7.2	4.5	3.2	4.1
13	3.8	16.2	14.6	13.3	16.8	10.7	10.8	9.9	7.2	4.4	3.2	3.9
14	3.8	12.4	13.5	12.2	21.0	10.2	9.9	10.2	7.3	4.3	3.2	3.6
15	3.8	9.9	12.5	11.2	18.0	10.0	9.8	10.0	7.2	4.2	3.2	3.6
16	3.9	8.9	11.7	11.0	16.8	10.3	9.8	9.8	6.9	4.2	3.2	3.7
17	3.8	9.3	12.6	12.2	14.4	10.8	9.7	9.5	6.7	4.1	3.1	4.2
18	4.2	7.8	12.5	30.9	15.1	10.7	11.0	12.4	6.5	4.0	3.1	4.9
19	5.0	8.0	13.0	44.1	14.6	10.6	10.7	18.0	6.2	4.0	3.1	4.3
20	4.8	11.3	12.1	48.2	13.8	10.6	10.7	18.9	5.9	3.9	3.0	3.9
21	4.6	26.6	11.3	41.8	12.8	10.7	10.3	17.1	5.7	3.8	2.9	3.7
22	4.3	29.1	10.9	34.8	12.5	10.8	10.0	15.0	5.6	3.8	3.0	3.5
23	4.0	30.1	10.4	26.0	12.6	10.8	9.9	13.6	5.5	3.8	2.9	3.4
24	3.8	29.1	12.4	19.3	11.2	11.1	9.7	12.5	5.4	3.8	2.8	3.3
25	3.7	26.2	11.7	19.0	10.7	12.0	9.7	12.2	5.4	3.9	2.8	3.3
26	3.7	19.8	12.9	18.6	10.6	11.9	9.7	11.7	5.4	3.7	2.8	3.3
27	3.6	16.8	12.5	17.7	10.0	11.0	9.7	10.6	5.5	3.6	2.8	3.3
28	3.5	16.5	12.0	17.8	9.8	10.3	9.3	9.8	5.6	3.5	2.7	4.3
29	3.4	19.8	11.6	16.9	....	9.7	8.9	9.3	5.7	3.5	2.7	4.4
30	3.4	25.3	12.6	15.8	....	9.3	8.4	8.9	5.7	3.5	2.7	4.1
31	3.4	....	14.8	15.2	....	9.3	....	8.8	....	3.4	2.7	....

CLACKAMAS RIVER NEAR CAZADERO, OREG.

Location.—In sec. 11, T. 4 S., R. 4 E., 2 miles above the dam of the Portland Railway, Light & Power Co., at Cazadero.

Records available.—April 6, 1908, to September 30, 1911.

Drainage area.—685 square miles.

Gage.—Friez automatic gage, referred to a vertical staff on the right bank.

Channel.—Rocks and gravel, shifting in extreme floods.

Discharge measurements.—Made from a cable 50 feet below the gage.

Accuracy.—Results excellent.

Cooperation.—Gage-height record and a part of the discharge measurements furnished by the Portland Railway, Light & Power Co.

The following discharge measurement was made by R. W. Davenport:

September 13, 1911: Gage height, 26.11 feet; discharge, 949 second-feet.

Daily gage height, in feet, of Clackamas River near Cazadero, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	26.20	26.14	28.85	27.50	27.95	26.60	29.0	27.90	29.0	27.00	26.10	25.92
2	26.34	26.16	29.90	27.40	28.00	26.60	28.8	28.30	28.9	26.90	26.10	25.91
3	27.76	26.26	31.74	27.30	27.75	26.60	28.5	28.8	28.5	26.85	26.10	25.97
4	28.10	26.23	31.17	27.25	27.60	26.65	28.20	29.4	28.25	26.80	26.10	26.20
5	27.24	26.17	30.35	27.30	27.50	26.70	27.90	29.4	28.00	26.75	26.10	26.85
6	26.83	26.35	29.55	27.30	27.40	26.80	27.70	29.0	27.95	26.70	26.10	26.50
7	26.60	28.03	29.58	27.50	27.30	27.05	27.55	28.6	27.90	26.65	26.10	26.20
8	26.48	29.80	29.82	27.60	27.20	27.15	27.55	28.7	27.85	26.65	26.05	26.10
9	26.40	29.51	30.25	27.80	27.20	27.25	27.60	28.6	27.80	26.55	26.05	26.30
10	26.37	30.70	29.28	27.75	27.15	27.30	27.90	28.45	27.75	26.50	26.05	26.30
11	26.33	30.05	28.73	27.60	27.20	27.25	27.75	28.30	27.95	26.45	26.00	26.15
12	26.34	28.96	28.39	27.45	27.20	27.30	27.60	28.40	28.10	26.45	26.00	26.10
13	26.28	27.98	28.13	27.30	27.30	27.30	27.50	28.5	28.05	26.40	26.00	26.10
14	26.26	27.76	27.93	27.15	27.20	27.35	27.45	28.40	27.90	26.40	26.00	26.10
15	26.22	27.29	27.80	27.15	27.10	27.55	27.40	28.40	27.70	26.35	26.00	26.30
16	26.20	27.13	27.70	27.05	27.05	27.80	27.50	28.35	27.55	26.30	26.00	26.70
17	26.30	26.99	27.76	27.20	27.05	27.85	27.45	28.6	27.40	26.30	26.00	26.70
18	26.48	27.04	27.51	30.4	27.15	27.85	27.60	30.5	27.30	26.30	26.00	26.45
19	26.34	27.10	27.49	31.7	27.15	27.85	27.75	31.2	27.25	26.30	26.00	26.30
20	26.29	27.81	27.33	29.8	27.10	28.20	27.70	30.0	27.15	26.25	26.00	26.20
21	26.26	31.35	27.32	28.9	27.05	28.40	27.80	29.5	27.10	26.25	26.00	26.15
22	26.22	31.06	27.22	28.45	26.95	28.6	27.95	29.4	27.00	26.25	25.99	26.10
23	26.19	32.90	27.53	28.15	26.90	29.0	28.05	29.0	27.00	26.20	25.98	26.10
24	26.19	30.38	28.32	27.95	26.85	28.9	28.15	28.7	26.90	26.20	25.97	26.05
25	26.20	29.26	28.14	27.75	26.85	28.6	28.80	28.40	26.85	26.20	25.96	26.05
26	26.18	28.36	27.90	27.60	26.75	28.25	28.6	28.30	26.90	26.15	25.96	26.10
27	26.16	28.19	27.94	27.45	26.70	27.95	28.30	28.10	27.10	26.15	25.97	26.10
28	26.14	28.35	27.85	27.40	26.60	27.75	28.00	28.05	27.00	26.15	25.97	26.10
29	26.14	29.16	27.78	27.30	......	27.80	27.85	28.15	27.00	26.10	25.95	26.05
30	26.14	29.44	27.74	27.50	......	28.05	27.80	28.35	27.10	26.10	25.94	26.00
31	26.14	......	27.61	27.80	......	28.6	......	28.7	......	26.10	25.93	......

Daily discharge, in second-feet, of Clackamas River near Cazadero, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	920	872	3,540	2,230	2,720	1,360	4,000	2,660	4,000	1,730	950	806
2	1,030	888	4,910	2,130	2,770	1,360	3,730	3,110	3,860	1,630	950	798
3	2,360	968	8,180	2,030	2,500	1,360	3,350	3,730	3,350	1,580	950	846
4	2,720	944	7,070	1,980	2,330	1,400	2,990	4,570	3,050	1,540	950	1,030
5	1,840	896	5,600	2,030	2,230	1,450	2,660	4,570	2,770	1,500	950	1,580
6	1,470	1,040	4,420	2,030	2,130	1,540	2,440	4,000	2,720	1,450	950	1,270
7	1,260	2,640	4,460	2,230	2,030	1,780	2,280	3,470	2,660	1,400	950	1,030
8	1,150	4,770	4,800	2,330	1,930	1,880	2,280	3,600	2,600	1,400	910	950
9	1,080	4,370	5,440	2,550	1,930	1,980	2,330	3,470	2,550	1,320	910	1,110
10	1,060	6,200	4,070	2,500	1,880	2,030	2,660	3,290	2,500	1,270	910	1,110
11	1,020	5,120	3,410	2,330	1,930	1,980	2,500	3,110	2,720	1,230	870	990
12	1,030	3,670	3,040	2,180	1,930	2,030	2,330	3,230	2,820	1,230	870	950
13	984	2,590	2,750	2,030	2,030	2,030	2,230	3,350	2,820	1,190	870	950
14	968	2,360	2,530	1,880	1,930	2,080	2,180	3,230	2,660	1,190	870	950
15	936	1,890	2,400	1,880	1,830	2,280	2,130	3,230	2,440	1,150	870	1,110
16	920	1,740	2,300	1,780	1,780	2,550	2,230	3,170	2,280	1,110	870	1,450
17	1,000	1,610	2,360	1,930	1,780	2,600	2,180	3,470	2,130	1,110	870	1,450
18	1,150	1,660	2,110	6,140	1,880	2,600	2,330	6,300	2,030	1,110	870	1,230
19	1,030	1,710	2,090	8,410	1,880	2,600	2,500	7,500	1,980	1,110	870	1,110
20	992	2,410	1,930	5,180	1,830	2,990	2,440	5,500	1,880	1,070	870	1,030
21	968	7,420	1,920	3,860	1,780	3,230	2,550	4,720	1,830	1,070	870	990
22	936	6,860	1,820	3,290	1,680	3,470	2,720	4,570	1,730	1,070	862	950
23	912	10,700	2,130	2,940	1,630	4,000	2,820	4,000	1,730	1,030	854	950
24	912	5,650	2,960	2,720	1,580	3,860	2,940	3,600	1,630	1,030	846	910
25	920	4,050	2,760	2,500	1,580	3,470	3,730	3,230	1,580	1,030	838	910
26	904	3,010	2,500	2,330	1,500	3,050	3,470	3,110	1,630	990	838	950
27	888	2,820	2,540	2,180	1,450	2,720	3,110	2,880	1,830	990	846	950
28	872	3,000	2,450	2,130	1,360	2,500	2,770	2,820	1,730	990	846	950
29	872	3,920	2,380	2,030	......	2,550	2,620	2,940	1,730	950	830	910
30	872	4,280	2,340	2,230	......	2,820	2,550	3,170	1,830	950	822	870
31	872	......	2,210	2,550	......	3,470	......	3,600	......	950	814	......

NOTE.—Discharge determined from two rating curves, well defined below 15,000 second-feet.

Monthly discharge of Clackamas River near Cazadero, Oreg., for the year ending Sept. 30, 1911.

[Drainage area, 685 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	2,720	872	1,120	1.64	1.89	68,900	A.
November	10,700	872	3,340	4.88	5.44	199,000	B.
December	8,180	1,820	3,340	4.88	5.63	205,000	A.
January	8,410	1,780	2,730	3.99	4.60	168,000	A.
February	2,770	1,360	1,920	2.80	2.92	107,000	A.
March	4,000	1,360	2,420	3.53	4.07	149,000	A.
April	4,000	2,130	2,700	3.94	4.40	161,000	A.
May	7,500	2,660	3,780	5.52	6.36	232,000	A.
June	4,000	1,580	2,370	3.46	3.86	141,000	A.
July	1,730	950	1,210	1.77	2.04	74,400	A.
August	950	814	882	1.29	1.49	54,200	A.
September	1,580	798	1,040	1.52	1.70	61,900	A.
The year	10,700	798	2,240	3.27	44.40	1,620,000	

CLACKAMAS RIVER AT ESTACADA, OREG.

Location.—In the Oregon Water Power Co.'s park at Estacada, about 2 miles below the dam at Cazadero.

Records available.—April 6, 1908, to September 13, 1911.

Drainage area.—688 square miles.[1]

Gage.—Inclined staff in three sections on right bank.

Channel.—Rocks and gravel; practically permanent.

Discharge measurements.—Made from cable 100 feet above the gage.

Accuracy.—Rating curve well defined. The accuracy of the estimates depends entirely on the accuracy of the gage heights, which represent only approximately the daily mean on account of fluctuations caused by the operation of the power plant above.

Cooperation.—Gage-height record furnished by N. L. S. Lauryy, of Estacada, Oreg.

The following discharge measurement was made by R. W. Davenport:

September 12, 1911: Gage height, 3.95 feet; discharge, 1,100 second-feet.

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[1] Incorrectly published as 668 square miles in 1909 and 1910 reports. Used incorrectly in 1910 report only.

Daily gage height, in feet, of Clackamas River at Estacada, Oreg., for the year ending Sept. 30, 1911.

[N. L. S. Lauryy, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	3.75	4.15	7.20	5.6	6.4	4.4	6.6	6.3	6.6	5.2	3.8	4.0
2	4.15	4.25	8.10	5.5	6.5	4.5	6.4	6.4	6.8	4.4	3.8	3.8
3	5.35	4.35	9.65	5.7	6.4	4.6	6.2	7.0	6.6	4.5	3.6	3.8
4	5.85	4.05	8.70	5.8	6.4	4.7	6.2	7.3	6.3	4.6	3.6	5.0
5	5.15	3.90	8.02	5.8	5.4	4.8	6.0	7.2	6.1	4.8	3.6	5.2
6	4.75	3.25	7.60	5.9	5.8	5.3	5.8	6.8	6.2	4.8	3.8	4.6
7	4.65	6.00	7.50	5.8	5.7	5.4	5.6	6.6	6.1	4.8	4.1	4.1
8	4.35	7.58	7.75	5.6	5.6	5.4	5.5	6.4	6.1	4.8	4.2	4.2
9	3.80	6.55	8.25	6.3	5.6	5.4	5.2	6.5	6.0	4.8	4.0	4.3
10	4.00	8.40	7.45	6.1	5.6	5.7	5.8	6.4	6.2	4.7	4.0	3.8
11	4.35	8.20	6.85	5.9	5.5	5.8	5.8	6.5	6.2	4.6	3.8	4.0
12	4.40	6.60	7.05	5.9	5.6	5.8	5.9	6.5	6.2	4.6	3.8	3.6
13	4.00	5.85	7.00	5.8	5.7	5.8	6.0	6.4	6.1	4.4	3.8	3.8
14	3.50	5.95	6.50	5.4	5.5	5.8	5.9	6.4	6.2	4.2	4.2	......
15	3.20	5.70	6.15	4.8	5.4	5.8	5.6	6.6	6.1	4.0	4.0	......
16	3.25	5.60	6.15	5.4	5.4	5.8	5.4	6.4	6.0	3.6	4.0	......
17	4.25	5.30	5.95	6.0	5.2	6.0	5.8	6.8	6.0	3.8	3.8	......
18	4.30	5.30	5.35	8.7	5.3	6.2	5.8	8.8	5.8	4.0	3.7	......
19	4.30	5.35	5.50	10.6	4.9	5.8	5.8	8.4	5.7	4.0	3.6	......
20	4.35	5.70	5.50	8.0	5.1	6.0	6.0	7.8	5.6	4.3	4.0	......
21	4.05	8.80	5.95	7.0	5.2	6.2	6.0	7.1	5.6	4.2	4.0	......
22	4.05	9.40	6.10	6.2	5.0	6.4	6.2	7.1	5.6	4.2	4.2	......
23	3.30	10.80	6.35	6.5	5.1	6.7	6.4	7.0	5.4	4.0	4.2	......
24	4.05	7.50	6.50	6.3	4.9	6.9	6.5	6.7	5.0	4.1	4.2	......
25	4.15	6.75	5.95	6.2	5.0	6.5	6.4	6.4	5.2	4.1	4.1	......
26	4.00	6.25	5.90	5.9	4.4	6.0	6.3	6.4	5.3	4.2	4.0	......
27	4.00	5.95	6.30	5.8	4.6	6.0	6.6	6.2	5.2	4.2	4.0	......
28	3.80	6.35	6.00	5.7	4.4	5.8	6.4	6.0	5.0	4.0	4.0	......
29	3.65	7.10	6.10	5.2	......	5.7	6.2	6.2	5.2	3.8	3.9	......
30	3.30	7.45	5.95	6.0	......	6.0	6.0	6.4	5.4	3.4	4.0	......
31	4.10	......	6.10	6.6	......	6.2	......	6.6	......	3.8	4.0	......

NOTE.—Mean gage heights based on one reading a day and subject to considerable error on account of diurnal fluctuations caused by operation of the power plant above the gage.

Daily discharge, in second-feet, of Clackamas River at Estacada, Oreg., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	985	1,280	5,030	2,700	3,770	1,480	4,070	3,620	4,070	2,250	1,020	1,160
2	1,280	1,360	6,650	2,580	3,920	1,570	3,770	3,770	4,380	1,480	1,020	1,020
3	2.420	1,440	9,680	2.820	3,770	1,660	3,480	4.700	4.070	1,570	880	1,020
4	3.000	1,200	7.790	2,940	3,770	1,750	3,480	5,200	3,620	1.660	880	2,040
5	2,200	1,090	6,460	2,940	2,470	1,840	3,200	5,030	3,340	1,840	880	2,250
6	1.800	695	5.730	3,070	2,940	2.360	2,940	4,380	3,480	1,840	1,020	1,660
7	1.700	3,200	5.550	2,940	2,820	2,470	2,700	4.070	3,340	1,840	1,240	1,240
8	1,440	5,550	6.000	2,700	2,700	2,470	2,580	3,770	3,340	1,840	1,320	1,320
9	1,020	4,140	6,940	3,620	2,700	2.470	2,250	3,920	3,200	1,840	1,160	1,400
10	1,160	7,220	5,460	3,340	2,700	2,820	2,940	3,770	3,480	1,750	1,160	1,020
11	1,440	6,840	4,460	3,070	2,580	2,940	2,940	3.920	3,480	1,660	1,020	1,160
12	1,480	4,070	4,780	3,070	2,700	2,940	3,070	3,920	3,480	1,660	1,020	880
13	1,160	3,000	4,700	2,940	2,820	2,940	3,200	3,770	3,340	1,480	1,020	1,020
14	820	3,140	3,920	2,470	2,580	2,940	3,070	3,770	3,480	1,320	1,320	......
15	670	2,820	3,410	1,840	2,470	2,940	2,700	4,070	3,340	1,160	1,160	......
16	695	2,700	3,410	2,470	2,470	2,940	2,470	3,770	3,200	880	1,160	......
17	1,360	2,360	3,140	3,200	2,250	3,200	2,940	4,380	3,200	1,020	1,020	......
18	1,400	2,360	2,420	7,790	2,360	3,480	2,940	7,980	2,940	1,160	950	......
19	1,400	2,420	2,580	11,700	1,940	2,940	2,940	7,220	2,820	1,160	880	......
20	1,440	2,820	2,580	6,460	2,140	3,200	3,200	6,090	2,700	1,400	1,160	......
21	1,200	7,980	3,140	4,700	2,250	3,480	3,200	4,860	2,700	1,320	1,160	......
22	1,200	9,180	3,340	3,480	2,040	3,770	3,480	4,860	2,700	1,320	1,320	......
23	720	12,200	3,700	3,920	2,140	4,220	3,770	4,700	2,470	1,160	1,320	......
24	1,200	5,550	3,920	3,620	1,940	4,540	3,920	4.220	2.040	1,240	1,320	......
25	1,280	4,300	3,140	3,480	2,040	3,920	3,770	3,770	2,250	1,240	1,240	......
26	1,160	3,550	3,070	3,070	1,480	3,200	3,620	3,770	2,360	1,320	1,160	......
27	1,160	3,140	3,620	2,940	1,660	3,200	4,070	3,480	2,250	1,320	1,160	......
28	1,020	3,700	3,200	2,820	1,480	2,940	3,770	3,200	2,040	1,160	1,160	......
29	915	4,860	3,340	2,250	......	2,820	3,480	3,480	2,250	1,020	1,090	......
30	720	5,460	3,140	3,200	......	3,200	3,200	3,770	2,470	770	1,160	......
31	1,240	......	3,340	4,070	......	3,480	......	4,070	......	1,020	1,160	......

NOTE.—Discharge determined from a well-defined rating curve.

Monthly discharge of Clackamas River at Estacada, Oreg., for the year ending Sept. 30, 1911.

[Drainage area, 688 square miles.]

Month.	Discharge in second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.
October	3,000	670	1,310	1.90	2.19	80,600
November	12,200	695	3,990	5.80	6.47	237,000
December	9,680	2,420	4,440	6.45	7.44	273,000
January	11,700	1,840	3,620	5.26	6.06	223,000
February	3,920	1,480	2,530	3.68	3.83	141,000
March	4,540	1,480	2,910	4.23	4.88	179,000
April	4,070	2,250	3,240	4.71	5.26	193,000
May	7,980	3,200	4,360	6.34	7.31	268,000
June	4,380	2,040	3,060	4.45	4.96	182,000
July	2,250	770	1,410	2.05	2.36	86.700
August	1,320	880	1,110	1.61	1.86	68,200
September 1-13	2,250	880	1,320	1.92	.93	34,000
The period						1,970,000

LEWIS RIVER NEAR COUGAR, WASH.

Location.—In sec. 29, T. 7 N., R. 5 E., three-fourths of a mile above Peterson's ranch, 1 mile below Swift Creek and about 6 miles east of Cougar.

Records available.—July 27, 1909, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on right bank since about July 1, 1910; prior to this date a vertical staff about 1,000 feet above Swift Creek, in sec. 28, T. 7 N., R. 5 E.

Channel.—Rocks and gravel; practically permanent.

Discharge measurements.—Made from a boat near the gage.

Cooperation.—Gage height record furnished by H. L. Gilbert, of Portland, Oreg.

Estimates withheld for additional data.

No discharge measurements made during the year.

Daily gage height, in feet, of Lewis River near Cougar, Wash., for the year ending Sept. 30, 1911.

[Ole Peterson, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	3.15	3.4	5.6	4.5	4.4	3.3	5.3	5.8	6.5	4.7	3.4	3.2
2	3.8	3.45	5.9	4.4	4.1	3.4	5.8	6.0	6.3	4.7	3.4	3.2
3	6.2	3.8	6.3	4.4	4.0	3.5	5.7	6.6	6.4	4.6	3.4	3.2
4	5.5	3.6	6.6	4.4	3.9	3.6	5.6	8.4	6.2	4.6	3.3	3.2
5	4.7	3.5	6.5	4.4	4.0	3.7	5.5	8.2	6.0	4.5	3.4	3.3
6	4.2	3.7	6.6	4.4	4.1	3.7	5.1	7.6	5.8	4.5	3.4	3.3
7	4.1	6.2	6.6	4.6	4.0	3.8	5.0	7.5	5.7	4.4	3.3	3.5
8	3.9	5.7	6.7	4.5	3.9	3.8	4.9	7.3	5.7	4.3	3.3	3.6
9	3.85	5.45	6.6	4.5	3.9	3.9	5.2	7.0	5.8	4.3	3.2	3.7
10	3.7	12.0	6.5	4.6	3.9	4.0	5.4	6.7	5.9	4.2	3.2	3.8
11	3.6	10.5	6.1	4.6	4.0	4.0	5.2	5.9	6.3	4.2	3.2	3.7
12	3.55	8.2	5.7	4.6	3.9	4.1	5.0	6.0	6.6	4.2	3.2	3.6
13	3.5	6.7	5.5	4.5	3.9	4.2	4.9	6.2	6.4	4.1	3.3	3.5
14	3.5	6.0	5.3	4.3	3.8	4.2	4.9	5.9	6.2	4.0	3.2	3.4
15	3.5	5.6	5.2	4.3	3.8	4.3	4.8	5.8	6.1	4.0	3.2	3.9
16	3.55	5.4	5.0	4.2	3.7	4.4	4.7	5.7	5.9	4.1	3.2	4.0
17	4.85	5.0	4.9	4.3	3.7	4.5	4.8	5.8	5.6	4.0	3.2	4.5
18	4.4	4.9	4.7	4.6	3.7	4.7	5.0	7.5	5.5	3.9	3.2	4.0
19	4.1	5.0	4.6	4.7	3.6	4.8	5.0	8.4	5.3	3.8	3.2	3.8
20	3.9	7.4	4.5	4.6	3.6	5.0	5.2	7.1	5.1	3.8	3.3	3.6
21	3.85	13.8	4.4	4.5	3.7	5.3	5.3	6.7	5.0	3.8	3.3	3.5
22	3.75	10.4	4.4	4.4	3.7	5.5	5.4	6.5	5.2	3.7	3.2	3.4
23	3.7	8.6	4.6	4.2	3.6	5.7	5.6	6.2	4.9	3.7	3.2	3.3
24	3.75	7.7	5.1	4.2	3.6	6.0	5.7	6.0	4.7	3.6	3.2	3.3
25	3.8	6.8	5	4.1	3.6	5.7	6.1	5.8	4.6	3.6	3.2	3.2
26	3.7	6.3	4.8	4.0	3.6	5.4	6.2	5.6	5.2	3.6	3.2	3.2
27	3.6	6.0	4.7	3.9	3.3	5.3	6.1	5.3	5.1	3.5	3.2	3.3
28	3.55	5.7	4.65	3.9	3.2	5.2	6.1	5.5	4.9	3.4	3.2	3.2
29	3.55	5.6	4.6	3.8	....	5.1	6.0	5.8	4.7	3.4	3.2	3.2
30	3.5	5.5	4.7	4.0	....	5.0	5.9	5.7	4.6	3.4	3.2	3.1
31	3.45	....	4.6	4.2	....	5.2	....	6.6	....	3.4	3.2	....

LEWIS RIVER NEAR AMBOY, WASH.

Location.—In sec. 36, T. 6 N., R. 3 E., at Cressups ferry crossing, on the county road from Amboy to Cougar, 1½ miles below Canyon Creek, 2 miles above Speilei Creek, and about 5 miles northwest of Amboy.

Records available.—January 20 to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on left bank.

Channel.—Gravel and small bowlders; practically permanent.

Discharge measurements.—Made from the ferry or from a boat about 30 feet above the gage.

Cooperation.—Gage-height record furnished by J. C. Stevens, of Portland, Oreg., until September 1, 1911. Gage record furnished by Northwestern Electric Co., since September 1, 1911.

Estimates withheld for additional data.

The following discharge measurement was made by S. C. Hulse:

September 26, 1910: Gage height, 0.26 foot; discharge, 1,140 second-feet.

Daily gage height, in feet, of Lewis River near Amboy, Wash., for the year ending Sept. 30, 1911.

[James Hanley, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	2.0	0.8	3.2	2.8	4.1	1.7	0.4	0.2
2	....	1.8	.8	3.0	3.0	3.8	1.7	.4	.2
3	....	1.6	.8	2.9	3.8	3.4	1.6	.4	.3
4	....	1.6	.8	2.8	5.4	3.1	1.6	.3	.4
5	....	1.4	1.0	2.5	5.0	3.0	1.7	.4	.5
6	....	1.3	1.1	2.4	4.3	2.8	1.8	.5	.5
7	....	1.3	1.3	2.2	3.8	2.9	1.6	.5	.4
8	....	1.3	1.5	2.1	3.7	2.8	1.4	.4	.4
9	....	1.2	1.7	2.3	3.4	2.8	1.3	.4	.6
10	....	1.2	1.6	2.7	3.4	2.8	1.3	.4	.8
11	....	1.3	1.6	2.6	3.0	2.9	1.2	.4	.8
12	....	1.2	1.6	2.4	3.1	3.5	1.1	.4	.5
13	....	1.4	1.5	2.2	3.6	3.4	1.2	.4	.6
14	....	1.3	1.6	2.0	3.4	3.2	1.2	.4	.6
15	....	1.2	1.8	2.0	3.4	3.2	1.2	.3	1.3
16	....	1.1	2.2	2.0	3.2	3.0	1.1	.3	2.2
17	....	1.1	2.3	1.9	3.6	2.8	1.1	.3	1.8
18	....	1.0	2.4	2.3	5.4	2.4	1.0	.4	1.5
19	....	1.2	2.4	2.2	5.1	2.4	.9	.4	1.2
20	....	1.1	2.8	2.2	4.5	2.2	.8	.4	.8
21	2.0	1.1	3.0	2.4	4.1	2.1	.8	.4	.8
22	1.8	1.1	3.0	2.5	3.8	2.0	.8	.3	.7
23	1.7	1.0	3.5	2.6	3.2	2.0	.7	.3	.6
24	1.7	1.0	3.5	3.0	3.4	1.8	.7	.2	.5
25	1.6	1.0	3.4	3.4	3.4	1.8	.7	.2	.5
26	1.6	.9	3.2	3.4	3.0	1.8	.7	.2	.5
27	1.4	.8	2.8	3.0	3.0	2.0	.6	.1	.4
28	1.4	.8	2.5	2.8	3.0	2.0	.6	.1	.5
29	1.3	....	2.4	2.8	3.0	1.9	.6	.1	.4
30	1.4	....	2.6	2.7	3.3	1.8	.5	.2	.4
31	1.8	....	3.0	....	3.8	....	.5	.2	....

KALAMA RIVER NEAR KALAMA, WASH.

Location.—In sec. 7, T. 6 N., R. 1 E., 150 feet below the power house of the Kalama Electric Light & Power Co., about 10½ miles above Kalama.

Records available.—July 6 to September 30, 1911; fragmentary.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Rocky; practically permanent.

Discharge measurements.—Made from cable 1½ miles below gage.

Cooperation.—Gage-height record furnished by the Kalama Electric Light & Power Co.

Estimates withheld for additional data.

No discharge measurements have been made.

Daily gage height, in feet, of Kalama River near Kalama, Wash., for the year ending Sept. 30, 1911.

[Jake Sorter, observer.]

Day.	July.	Aug.	Sept.	Day.	July.	Aug.	Sept.	Day.	July.	Aug.	Sept.
1	......	3.0	2.8	11	3.4	2.9	3.0	21	3.2	2.9	3.4
2	......	3.0	3.0	12	3.4	2.9	2.9	22	3.1	2.9	3.2
3	......	3.0	3.0	13	3.3	2.9	3.0	23	3.1	2.9	3.1
4	......	3.0	3.0	14	3.2	2.9	3.0	24	3.1	2.9	3.0
5	......	3.0	3.0	15	3.2	2.9	3.6	25	3.1	2.9	3.0
6	3.4	2.9	3.0	16	3.2	2.9	4.3	26	3.0	2.9	3.0
7	3.5	2.9	3.0	17	3.2	2.9	4.0	27	3.0	2.8	3.0
8	3.4	2.9	2.9	18	3.2	2.9	3.5	28	3.0	2.8	3.0
9	3.4	2.9	3.2	19	3.2	2.9	3.5	29	3.0	2.8	3.0
10	3.4	2.9	3.0	20	3.2	3.0	3.5	30	3.0	2.8	3.0
								31	3.0	2.8	......

OHANAPECOSH RIVER NEAR LEWIS, WASH.

Location.—In sec. 29, T. 14 N., R. 10 E., about 800 feet above Clear Fork, just above the crossing of the Yakima Valley trail, 7 miles northeast of Lewis.

Records available.—August 19, 1907, to September 30, 1911.

Drainage area.—116 square miles.

Gage.—Vertical staff.

Channel.—Bowlders and coarse gravel; shifting in floods.

Discharge measurements.—Made from cable 25 feet below the gage or by wading.

Accuracy.—Results fair.

Cooperation.—Field data furnished by the Valley Development Co.

Discharge measurements of Ohanapecosh River near Lewis, Wash., in 1907–1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1907		*Feet.*	*Sec.-ft.*	1910		*Feet.*	*Sec.-ft.*
Aug. 19		0.50	133	Nov. 25		2.40	762
Nov. 22	J. C. Stevens	1.58	520				
				1911			
1910				May 31		3.90	1,800
Aug. 27	C. W. Harris	.82	142	June 13		4.50	2,370
Oct. 30		1.40	252	29		2.55	950
30		1.40	248	Oct. 6	G. L. Parker	.64	126
30		1.40	263				

NOTE.—Discharge measurements of Aug. 19, 1907, Oct. 30 and Nov. 25, 1910, May 31, June 13 and 29, 1911, made by employees of the Valley Development Co.

Daily gage height, in feet, and discharge, in second-feet, of Ohanapecosh River near Lewis, Wash., for the year ending Sept. 30, 1907.

Day.	Aug.		Sept.		Day.	Aug.		Sept.	
	Gage height.	Discharge.	Gage height.	Discharge.		Gage height.	Discharge.	Gage height.	Discharge.
1			0.5	133	16			1.2	320
2			.6	151	17			1.0	255
3			.5	133	18			.9	226
4			.5	133	19	0.5	133	.8	198
5			.5	133	20	.5	133	.6	151
6			.5	133	21	.5	133	.6	151
7			.5	133	22	.6	151	.5	133
8			.5	133	23	.7	173	.5	133
9			.4	115	24	.8	198	.5	133
10			.4	115	25	.7	173	.5	133
11			.4	115	26	.6	151	.5	133
12			.4	115	27	.5	133	.5	133
13			.4	115	28	.5	133	.5	133
14			.4	115	29	.5	133	.4	115
15			.5	133	30	.4	115	.4	115
					31	.4	115		

Daily gage height in feet, of Ohanapecosh River near Lewis, Wash., for the years ending Sept. 30, 1908–1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1907–8.												
1	0.4	0.4	....	1.1	0.5	0.95	1.1	2.8	2.3	4.6	1.5	0.5
2	.5	.6	2.3	1.1	.7	.85	1.0	2.9	2.3	4.4	1.4	.5
3	.4	.5	2.1	1.0	.7	.85	1.1	2.6	2.3	4.3	1.2	.55
4	.4	.4	2.2	1.0	.7	.8	1.1	2.35	2.25	3.8	1.2	.55
5	.4	.4	2.2	1.0	.8	.75	1.1	2.3	2.3	3.5	1.15	.55
6	.4	.4	1.9	1.0	.8	.7	1.0	2.5	2.5	3.4	1.15	.55
7	.4	.4	1.8	1.0	.75	.7	1.0	3.3	3.0	3.7	1.1	.55
8	.4	.4	1.7	1.1	.7	.65	.95	2.9	4.2	4.0	1.1	.55
9	.3	.4	1.5	1.2	.7	.6	1.0	2.6	4.6	4.1	1.0	.45
10	.3	.4	1.4	1.2	.75	.6	1.1	2.3	4.8	3.8	1.0	.45
11	.3	.3	1.3	1.1	.75	.7	1.2	2.0	4.8	3.7	.95	.55
12	.3	.3	1.3	1.0	.6	.8	1.5	1.9	4.1	3.9	.9	.55
13	.3	.3	1.5	1.0	.6	2.1	1.9	1.8	4.0	4.1	.9	.55
14	.3	.5	1.4	.95	.6	2.7	1.9	1.75	4.3	3.5	.95	.55
15	.3	.5	1.2	.8	.65	6.0	1.9	1.9	4.7	3.2	.9	.55
16	.3	.7	1.1	.85	.75	6.0	1.3	1.7	3.8	3.2	.9	.45
17	.3	.6	1.1	.9	.9	3.4	2.2	1.6	3.5	2.8	.9	.4
18	.3	.5	1.0	.85	.9	2.6	3.8	2.0	3.2	2.95	.9	.4
19	.3	.6	.95	.8	.85	2.1	4.3	2.1	3.0	2.9	.9	.4
20	.3	.6	.95	1.0	.8	1.85	4.4	2.1	2.6	2.85	.85	.4
21	.3	.6	1.1	.95	.75	1.6	3.4	2.2	2.3	2.95	.85	.4
22	.3	1.6	1.5	.8	.75	1.2	2.8	2.2	2.3	2.95	.85	.4
23	.3	1.1	2.4	.8	.75	1.5	2.6	2.5	2.4	2.6	.8	.35
24	.3	....	3.3	.75	.75	1.7	2.7	2.8	2.9	2.6	.75	.3
25	.3	....	2.6	.75	.75	1.7	2.35	3.1	3.9	2.0	.7	.25
26	.3	....	2.4	.75	1.0	1.6	2.1	2.7	3.9	1.8	.6	.2
27	.3	....	2.3	.75	1.1	1.5	2.1	2.5	3.2	1.55	.55	.25
28	.3	....	1.7	.7	1.1	1.3	1.9	2.7	3.0	1.5	.75	.25
29	.6	....	1.5	.7	1.0	1.3	1.9	2.75	3.2	1.4	.7	.25
30	.4	....	1.3	.65	....	1.2	2.2	2.5	4.0	1.4	.55	.35
31	.4	....	1.2	.5	....	1.1	....	2.3	....	1.45	.55	....
1908–9.												
1	.5	1.9	.95	.75	.9	1.0	1.65	1.55	4.2	2.8	1.35	.65
2	.35	2.3	.9	.85	.85	.95	1.55	1.7	5.3	3.0	1.15	.75
3	.3	2.0	.9	1.0	.95	.95	1.4	2.7	4.6	3.35	1.2	.75
4	.25	1.55	.85	1.4	.95	.95	1.3	3.5	4.2	3.0	1.2	.75
5	.25	1.25	.8	1.25	.95	.9	1.2	2.9	3.9	2.9	1.15	.75
6	.2	1.1	.75	1.1	.9	.9	1.15	2.35	3.6	2.9	1.0	.75
7	.25	1.0	.75	1.1	.9	.85	1.05	2.15	3.5	2.85	1.0	.65
8	.25	.4	.85	.95	.85	.85	1.05	1.95	3.4	2.6	1.0	.6
9	.25	.8	.8	.9	.8	.85	1.2	2.1	3.6	2.9	.95	.55
10	.3	.75	.75	.85	.8	.8	1.25	2.0	4.0	2.7	1.0	.55
11	.25	.7	.7	.85	.75	.8	1.25	1.85	4.3	3.2	.9	.55
12	.3	.65	.8	.7	.7	.8	1.3	1.8	4.2	2.65	.9	.45
13	.7	.6	1.0	.7	.7	.85	1.35	1.8	3.7	2.25	.9	.5
14	.95	.55	.95	.65	.7	.85	1.4	1.8	3.5	2.2	.9	.45
15	.7	.55	.85	.75	.75	.9	1.35	1.9	4.15	2.35	.85	.45
16	.55	.9	.8	.8	1.1	1.0	1.3	1.95	3.8	2.4	.8	.45
17	.45	1.9	.7	1.45	2.0	1.1	1.25	1.95	3.7	2.0	.8	.45
18	.3	3.6	.7	2.0	1.9	1.1	1.2	2.05	3.6	1.85	.8	.4
19	.5	2.3	.7	3.2	1.7	1.1	1.2	2.3	3.6	1.75	.85	.35
20	.4	2.5	.7	4.1	1.75	1.0	1.3	2.2	3.3	1.8	.85	.6
21	.4	2.35	.65	3.55	1.25	.95	1.2	2.0	3.15	1.8	.7	.55
22	.35	2.3	.65	2.4	1.15	.95	1.25	2.05	3.0	1.9	.7	.4
23	.4	2.1	.7	2.0	1.1	.95	1.3	2.1	3.1	1.9	.65	.35
24	.45	1.75	.65	1.85	1.1	.95	1.2	2.4	2.95	1.8	.65	.4
25	.3	1.5	.9	1.45	1.1	1.0	1.3	2.8	2.9	1.7	.6	.45
26	.4	1.3	1.0	1.3	1.05	1.15	1.8	3.5	3.55	1.55	1.15	.4
27	.55	1.2	1.15	1.2	1.05	1.3	1.8	3.8	3.55	1.5	.8	.4
28	.55	1.1	1.2	1.0	1.1	1.3	1.75	3.6	3.7	1.4	.65	.45
29	1.2	1.1	1.1	.95	....	1.3	1.7	3.2	2.6	1.4	.6	.5
30	1.9	1.1	.95	.95	....	1.2	1.55	3.1	2.8	1.45	.6	.45
31	2.25	....	.85	.95	....	1.35	....	3.7	....	1.4	.6	....
1909–10.												
1	.4	.55	4.0	1.2	1.85	....	1.9	2.6	4.1	2.25	1.25	.75
2	.35	5.6	3.1	1.1	1.7	....	1.85	2.45	3.25	2.25	1.2	.85
3	.35	7.8	2.55	1.0	1.6	....	1.8	2.5	2.75	2.1	1.2	.85
4	.3	3.8	2.2	1.0	1.5	....	1.7	2.6	2.7	2.15	1.2	.8
5	.3	2.8	2.0	1.0	1.5	....	1.7	2.55	3.15	2.1	1.2	.8

Daily gage height in feet, of Ohanapecosh River near Lewis, Wash., for the years ending Sept. 30, 1908–1911—Continued.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1909–10—Con.												
6	0.65	2.2	1.95	1.0	1.5	....	1.8	2.75	3.0	2.1	1.2	0.8
7	.4	1.85	1.9	1.0	1.4	....	1.85	3.6	2.7	2.1	1.4	.7
8	.4	1.95	1.85	1.0	1.3	....	1.9	4.0	2.4	2.15	1.4	.65
9	.35	1.8	1.75	.95	1.25	....	2.0	4.2	2.5	2.25	1.6	.65
10	.35	1.75	1.55	.95	1.2	....	2.0	5.2	2.8	2.4	1.4	.7
11	.4	1.45	1.55	.9	1.2	....	2.3	4.7	4.4	2.25	1.2	.65
12	.35	1.35	3.6	.9	1.15	....	2.55	4.2	3.4	2.2	1.15	.6
13	.4	1.3	2.85	.85	1.25	....	2.45	3.8	2.8	2.4	1.1	.65
14	.35	1.15	2.4	.85	1.2	2.5	2.25	3.4	2.8	1.9	1.1	.65
15	.35	1.05	2.15	.8	1.15	3.0	2.15	3.1	2.8	1.85	1.0	.65
16	.3	1.0	1.9	.8	1.1	3.1	2.2	2.9	2.9	1.85	.9	.7
17	.25	1.0	1.85	.7	1.0	3.7	2.3	3.0	2.65	1.8	.85	.8
18	.25	6.1	1.75	.85	1.0	3.5	2.5	3.55	2.5	1.75	.85	.7
19	.3	6.6	1.65	.85	1.0	3.9	2.9	3.35	3.0	1.75	.9	.7
20	.5	4.15	1.55	.85	1.0	3.3	3.75	2.9	2.7	1.75	.9	.8
21	.6	3.0	1.45	1.0	.95	3.7	3.4	2.9	2.35	1.75	1.0	.9
22	.45	6.1	1.4	2.3	.9	3.6	3.1	3.25	2.25	1.7	.95	.95
23	.4	(a)	1.35	4.1	.95	3.2	3.45	3.95	2.15	1.45	.85	.85
24	.65	6.4	1.3	3.95	1.25	3.0	4.15	4.5	2.2	1.4	.8	.8
25	.45	4.3	1.3	3.0	1.65	2.75	4.8	4.2	2.45	1.5	.8	.7
26	.4	3.2	1.25	2.5	1.6	2.3	4.9	3.7	2.5	1.45	.8	.7
27	.35	2.4	1.25	2.2	1.75	2.2	3.9	3.7	2.5	1.35	.8	.65
28	.35	3.0	1.25	2.0	1.6	2.0	3.6	3.1	2.4	1.3	.8	.7
29	.4	7.0	1.15	1.9	....	1.95	2.95	3.3	2.1	1.35	.6	.85
30	.35	5.8	1.3	1.85	....	1.9	2.7	3.5	2.25	1.3	.75	.95
31	.4	....	1.25	2.0	....	1.9	....	3.8	....	1.3	.75	....
1910–11.												
1	1.35	1.35	1.6	1.2	.85	0.45	1.9	2.1	4.4	2.35	1.1	.75
2	1.0	1.3	2.0	1.15	.75	.45	1.9	2.3	4.2	2.35	1.0	.7
3	4.0	1.4	2.2	1.05	.75	.5	1.75	2.5	3.35	2.7	1.1	.7
4	2.75	1.3	2.25	1.1	.75	.55	1.6	3.1	2.95	2.75	1.0	.65
5	2.65	1.3	2.1	1.1	.75	.55	1.5	3.15	2.45	2.7	1.0	.8
6	2.6	1.6	2.0	1.25	.75	.6	1.4	2.6	2.65	3.0	1.0	.6
7	2.8	5.15	2.1	1.5	.7	.65	1.35	2.3	2.85	2.75	.95	.75
8	2.5	3.0	2.1	1.4	.7	.65	1.35	2.15	2.7	2.35	.9	.65
9	2.4	2.9	2.1	1.4	.7	.65	1.45	2.15	2.9	2.25	.85	....
10	1.9	....	1.95	1.3	.7	.65	1.5	2.0	3.3	2.05	.9	1.0
11	1.75	4.9	1.65	1.2	.65	.65	1.5	1.9	4.3	2.05	.85	....
12	1.65	3.5	1.5	1.15	.65	.6	1.35	1.95	4.75	2.1	.85	.85
13	1.5	2.7	1.35	1.05	.65	.6	1.3	2.0	4.6	2.05	.8	....
14	1.5	2.3	1.4	1.0	.65	.6	1.2	1.9	4.2	2.3	.8	1.2
15	1.5	2.1	1.4	1.0	.6	.75	1.25	2.0	2.9	2.3	.8	....
16	1.45	1.8	1.3	1.0	.6	.9	1.25	2.5	3.6	2.5	.75	1.6
17	2.75	1.6	1.25	1.05	.6	1.1	1.3	2.5	3.4	2.2	.75	....
18	2.0	1.5	1.25	1.05	.6	1.25	1.4	2.6	3.2	2.0	.75	1.3
19	1.9	1.45	1.2	1.05	.6	1.3	1.35	2.5	2.95	1.85	.8	....
20	1.6	2.1	1.2	.95	.6	1.6	1.35	2.3	2.8	1.7	.75	1.1
21	1.5	....	1.15	.9	.6	1.7	1.6	2.4	2.8	1.6	.7	....
22	1.4	4.5	1.1	.85	.6	1.8	1.7	2.7	3.15	1.4	.7	1.05
23	1.35	3.55	1.4	.8	.55	2.4	1.8	2.4	2.7	1.35	.7	....
24	1.8	2.8	1.6	.8	.55	2.25	2.1	2.2	2.3	1.4	.7	.85
25	2.45	2.3	1.5	.8	.6	1.8	2.8	2.2	2.3	1.45	.7	....
26	1.8	2.1	1.5	.75	.6	1.7	2.4	1.95	2.45	1.35	.7	.8
27	1.6	2.0	1.45	.75	.55	1.65	2.2	1.95	3.3	1.2	.7	....
28	1.55	1.7	1.35	.75	.55	1.4	1.95	2.0	2.85	1.15	.7	.7
29	1.5	1.7	1.2	.7	....	1.35	....	2.35	2.55	1.2	.7	....
30	1.4	1.7	1.25	.7	....	1.4	....	3.0	2.45	1.15	.7	.7
31	1.35	....	1.25	.8	....	1.6	....	3.9	....	1.1	.7	....

a Over gage.

Daily discharge, in second-feet, of Ohanapecosh River near Lewis, Wash., for the years ending Sept. 30, 1908–1911.

Day.	Oct.	Nov	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1907–8.											
1	115	115	1,130	287	133	240	231	1,050	740	2,410	365
2	133	151	880	287	173	212	205	1,120	740	2,240	327
3	115	133	760	255	173	212	231	920	740	2,150	259
4	115	115	820	255	173	198	231	770	712	1,750	259
5	115	115	820	255	198	186	231	740	740	1,530	245
6	115	115	640	255	198	173	205	860	860	1,460	245
7	115	115	590	255	186	173	205	1,390	1,180	1,680	231
8	115	115	540	287	173	162	193	1,120	2,070	1,910	231
9	98	115	440	320	173	151	205	920	2,410	1,990	205
10	98	115	395	320	186	151	231	740	2,580	1,750	205
11	98	98	355	287	186	173	259	580	2,580	1,680	193
12	98	98	355	255	151	198	365	535	1,990	1,830	181
13	98	98	440	255	151	760	535	490	1,910	1,990	181
14	98	133	395	240	151	1,130	535	468	2,150	1,530	193
15	98	133	320	198	162	3,800	535	535	2,490	1,320	181
16	98	173	287	212	186	3,620	291	445	1,750	1,320	181
17	98	151	287	226	226	1,460	685	405	1,530	1,050	181
18	98	133	255	212	226	920	1,750	580	1,320	1,150	181
19	98	151	240	198	212	630	2,150	630	1,180	1,120	181
20	98	151	240	255	198	512	2,240	630	920	1,080	170
21	98	151	287	240	186	405	1,460	685	740	1,150	170
22	98	490	440	198	186	259	1,050	685	740	1,150	170
23	98	287	940	198	186	365	920	860	800	920	159
24	98	540	1,550	186	186	445	985	1,050	1,120	920	148
25	98	760	1,060	186	186	445	770	1,250	1,830	580	138
26	98	1,200	940	186	255	405	630	985	1,830	490	118
27	98	760	880	186	287	365	630	860	1,320	385	109
28	98	820	540	173	287	291	535	985	1,180	365	148
29	151	2,100	440	173	255	291	535	1,020	1,320	327	138
30	115	1,400	355	162	....	259	685	860	1,910	327	109
31	115	....	320	133	....	231	....	740	....	346	109
1908–9.											
1	....	535	193	148	181	205	425	385	2,070	1,050	309
2	....	740	181	170	170	193	385	445	3,010	1,180	245
3	....	580	181	205	193	193	327	985	2,410	1,420	259
4	....	885	170	327	193	193	291	1,530	2,070	1,180	259
5	....	275	159	275	193	181	259	1,120	1,830	1,120	245
6	....	231	148	231	181	181	245	770	1,600	1,120	205
7	....	205	148	231	181	170	218	658	1,530	1,080	205
8	....	84	170	193	170	170	218	558	1,460	920	205
9	....	159	159	181	159	170	259	630	1,600	1,120	193
10	....	148	148	170	159	159	275	580	1,910	985	205
11	....	138	138	170	148	159	275	512	2,150	1,320	181
12	....	128	159	138	138	159	291	490	2,070	952	181
13	....	118	205	138	138	170	309	490	1,680	712	181
14	....	109	193	128	138	170	327	490	1,530	685	181
15	....	109	170	148	148	181	309	535	2,030	770	170
16	....	181	159	159	231	205	291	558	1,750	800	159
17	....	535	138	346	580	231	275	558	1,680	580	159
18	....	1,600	138	580	535	231	259	606	1,600	512	159
19	....	740	138	1,320	445	231	259	740	1,600	468	170
20	....	860	138	1,990	468	205	291	685	1,390	490	170
21	....	770	128	1,570	275	193	259	580	1,280	490	138
22	....	740	128	800	245	193	275	605	1,180	535	138
23	....	630	138	580	231	193	291	630	1,250	535	128
24	....	468	128	512	231	193	259	800	1,150	490	128
25	....	365	181	346	231	205	291	1,050	1,120	445	118
26	....	291	205	291	218	245	490	1,350	1,570	385	245
27	....	259	245	259	218	291	490	1,750	1,570	365	159
28	....	231	259	205	231	291	468	1,600	985	327	128
29	....	231	231	193	....	291	445	1,320	920	327	118
30	....	231	193	193	....	259	385	1,250	1,050	346	118
31	....	....	170	193	....	309	....	1,680	....	327	118

Daily discharge, in second-feet, of Ohanapecosh River near Lewis, Wash., for the years ending Sept. 30, 1908–1911—Continued.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1909–10.												
1	....	109	1,860	216	440	240	460	840	1,940	630	230	119
2	....	3,270	1,170	190	380	2,180	440	750	1,280	630	216	138
3	....	5,240	810	167	340	1,460	420	780	930	550	216	138
4	....	1,750	600	167	305	960	380	840	900	575	216	128
5	....	1,050	500	167	305	720	380	810	1,200	550	216	128
6	....	685	480	167	305	600	420	930	1,100	550	216	128
7	....	512	460	167	275	500	440	1,540	900	550	275	110
8	....	558	440	167	245	420	460	1,860	720	575	275	102
9	....	490	400	157	230	420	500	2,020	780	630	340	102
10	....	468	322	157	216	380	500	2,860	960	720	275	110
11	....	346	322	147	216	460	660	2,420	2,180	630	216	102
12	....	309	1,540	147	203	600	810	2,020	1,380	600	203	93
13	....	291	995	138	230	660	750	1,700	960	720	190	102
14	....	245	720	138	216	780	630	1,380	960	460	190	102
15	....	218	575	128	203	1,100	575	1,170	960	440	167	102
16	....	205	460	128	190	1,170	600	1,030	1,030	440	147	110
17	....	205	440	110	167	1,620	660	1,100	870	420	138	128
18	....	3,710	400	138	167	1,460	780	1,500	780	400	138	110
19	....	4,150	360	138	167	1,780	1,030	1,340	1,100	400	147	110
20	....	2,030	322	138	167	1,310	1,660	1,030	900	400	147	128
21	....	1,180	290	167	157	1,620	1,380	1,030	690	400	167	147
22	....	3,710	275	660	147	1,540	1,170	1,280	630	380	157	157
23	....	7,500	260	1,940	157	1,240	1,420	1,820	575	290	138	138
24	....	3,940	245	1,820	230	1,100	1,980	2,260	600	275	128	128
25	....	2,100	245	1,100	360	930	2,500	2,020	750	305	128	110
26	....	1,240	230	780	340	660	2,590	1,620	780	290	128	110
27	....	720	230	600	400	600	1,780	1,620	780	260	128	102
28	....	1,100	230	500	340	500	1,540	1,170	720	245	128	110
29	....	4,480	203	460	....	480	1,060	1,310	550	260	93	138
30	....	3,400	245	440	....	460	900	1,460	630	245	119	157
31	....	....	230	500	....	460	....	1,700	....	245	119	....
1910–11.												
1	260	260	405	259	170	92	535	630	2,240	770	231	148
2	167	245	580	245	148	92	535	740	2,070	770	205	138
3	1,860	275	685	218	148	100	468	860	1,420	985	231	138
4	930	245	712	231	148	109	405	1,250	1,150	1,020	205	128
5	870	245	630	231	148	109	365	1,280	830	985	205	159
6	840	340	580	275	148	118	327	920	952	1,180	205	118
7	960	2,820	630	365	138	128	309	740	1,080	1,020	193	148
8	780	1,100	630	327	138	128	309	652	985	770	181	128
9	720	1,030	630	327	138	128	346	652	1,120	712	170	166
10	460	1,810	558	291	138	128	365	580	1,390	605	181	205
11	400	2,590	425	259	128	128	365	535	2,150	605	170	188
12	360	1,460	365	245	128	118	309	558	2,540	630	170	170
13	305	900	309	218	128	118	291	580	2,410	605	159	214
14	305	660	327	205	128	118	259	535	2,070	740	159	260
15	305	550	327	205	118	148	275	580	1,120	740	159	332
16	290	420	291	205	118	181	275	860	1,600	860	148	405
17	930	340	275	218	118	231	291	860	1,460	685	148	348
18	500	305	275	218	118	275	327	920	1,320	580	148	291
19	460	290	259	218	118	291	309	860	1,150	512	159	261
20	340	550	259	195	118	405	309	740	1,050	445	148	231
21	305	1,400	245	181	118	445	405	800	1,050	405	138	224
22	275	2,260	231	170	118	490	445	985	1,280	327	138	218
23	260	1,570	327	159	109	800	490	800	985	309	138	194
24	420	1,050	405	159	109	712	630	685	740	327	138	170
25	750	740	365	159	118	490	1,050	685	740	346	138	164
26	420	630	365	148	118	445	800	558	830	309	138	159
27	340	580	346	148	109	425	685	558	1,390	259	138	148
28	322	445	309	148	109	327	558	580	1,080	245	138	138
29	305	445	259	138	....	309	582	770	890	259	138	138
30	275	445	275	138	....	327	606	1,180	830	245	138	138
31	260	....	275	159	....	405	....	1,830	....	231	138	....

NOTE.—Discharge determined as follows: Aug. 19, 1907, to Mar. 15, 1908, and Mar. 16, 1908, to Nov. 22, 1909, from poorly defined rating curves; Nov. 24, 1909, to Nov. 22, 1910, from a rating curve fairly well defined between 100 and 800 second-feet; Nov. 23, 1910, to Sept. 30, 1911, from a rating curve well defined below 3,000 second-feet; Nov. 24 to Dec. 1, 1907, estimated by comparison with Cowlitz River at Lewis; September, 1908, estimated as 120 second-feet; October, 1908, as 140 second-feet; September, 1909, as 135 second-feet; and October, 1909, as 115 second-feet, by comparison with records of adjacent stations. Discharge for Nov. 23, 1909, estimated, as water was over gage. Discharge Mar. 1 to 13, 1910, estimated by comparison with Cowlitz River at Lewis. Discharge interpolated for all other days when no gage height was reported.

Monthly discharge of Ohanapecosh River above Clear Fork, near Lewis, Wash., for 1907–1911.

[Drainage area, 116 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
1907.							
August 19–31	198	115	144	1.24	0.60	3,710	B.
September	320	115	146	1.26	1.41	8,690	B.
The period						12,400	
1907–8.							
October	151	98	106	.914	1.05	6,520	B.
November	2,100	98	368	3.17	3.54	21,900	B.
December	1,550	240	579	4.99	5.75	35,600	B.
January	320	133	231	1.99	2.29	14,200	B.
February	287	133	194	1.67	1.80	11,200	B.
March	3,800	151	607	5.23	6.03	37,300	B.
April	2,240	193	657	5.66	6.32	39,100	B.
May	1,390	405	803	6.92	7.98	49,400	B.
June	2,580	712	1,450	12.5	13.95	86,300	B.
July	2,410	327	1,290	11.1	12.80	79,300	B.
August	365	109	191	1.65	1.90	11,700	C.
September			120	1.03	1.15	7,140	D.
The year	3,800		547	4.72	64.56	400,000	
1908–9.							
October			140	1.21	1.40	8,610	D.
November	1,600	84	401	3.46	3.86	23,900	C.
December	259	128	169	1.46	1.68	10,400	C.
January	1,990	128	400	3.45	3.98	24,600	C.
February	580	138	237	2.04	2.12	13,200	C.
March	309	159	207	1.78	2.05	12,700	C.
April	490	218	315	2.72	3.04	18,700	C.
May	1,750	385	843	7.27	8.38	51,800	B.
June	3,010	920	1,630	14.1	15.73	97,000	B.
July	1,420	327	743	6.41	7.39	45,700	B.
August	309	118	180	1.55	1.79	11,100	C.
September			135	1.16	1.29	8,030	D.
The year	3,010		446	3.84	52.71	326,000	
1909–10.							
October			115	.991	1.14	7,070	D.
November	7,500	109	1,840	15.9	17.74	109,000	C.
December	1,860	203	512	4.41	5.08	31,500	C.
January	1,940	110	388	3.34	3.85	23,900	C.
February	440	147	254	2.19	2.28	14,100	C.
March	2,180	380	916	7.90	9.11	56,300	C.
April	2,590	380	962	8.29	9.25	57,200	B.
May	2,860	750	1,460	12.6	14.53	89,800	B.
June	2,180	550	951	8.20	9.15	56,600	B.
July	720	245	454	3.91	4.51	27,900	B.
August	340	93	180	1.55	1.79	11,100	C.
September	157	93	120	1.03	1.15	7,140	C.
The year	7,500		677	5.84	79.58	492,000	
1910–11.							
October	1,860	167	515	4.44	5.12	31,700	B.
November	2,820	245	867	7.47	8.33	51,600	B.
December	712	231	405	3.49	4.02	24,900	B.
January	365	138	215	1.85	2.13	13,200	B.
February	170	109	128	1.10	1.14	7,110	B.
March	800	92	268	2.31	2.66	16,500	B.
April	1,050	259	441	3.80	4.24	26,200	B.
May	1,830	535	799	6.89	7.94	49,100	B.
June	2,540	740	1,330	11.5	12.83	79,100	B.
July	1,180	231	596	5.14	5.93	36,600	B.
August	231	138	164	1.41	1.63	10,100	A.
September	405	118	196	1.69	1.89	11,700	A.
The year	2,820	92	494	4.26	57.86	358,000	

NOTE.—See note to daily discharge tables.

COWLITZ RIVER AT LEWIS, WASH.

Location.—In sec. 15, T. 13 N., R. 9 E., at the ferry at Lewis.

Record available.—July 1 to September 30, 1911.

Drainage area.—275 square miles.

Gage.—Vertical staff.

Channel.—Gravel; shifting at high water.

Discharge measurements.—Made from the ferry or by wading near the gage.

Accuracy.—Results prior to July 1, 1911, were so unreliable that they are withheld until a further study can be made. Results after July 1, 1911, fair.

Cooperation.—Field data furnished by the Valley Development Co.

Discharge measurements of Cowlitz River at Lewis, Wash., in 1907–1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1907.		*Feet.*	*Sec.-ft.*	1910.		*Feet.*	*Sec.-ft.*
Aug. 15		1.04	695	Oct. 17		2.94	2,500
17		1.16	816	Nov. 18		1.95	1,140
Nov. 25	J. C. Stevens	2.30	1,910	1911.			
				Oct. 5	G. L. Parker	1.12	376

NOTE.—Discharge measurements of Aug. 15 and 17, 1907, Oct. 17, and Nov. 18, 1910, were made by employees of the Valley Development Co.

Daily gage height, in feet, and discharge, in second-feet, of Cowlitz River at Lewis, Wash., for the year ending Sept. 30, 1911.

Day.	July.		August.		September.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	2.6	1,950	1.8	950	1.55	705
2	2.6	1,950	1.75	900	1.45	615
3	2.8	2,270	1.85	1,000	1.5	660
4	2.95	2,520	1.8	950	1.4	570
5	2.9	2,430	1.8	950	1.5	660
6	3.2	2,940	1.7	850	1.35	530
7	2.9	2,430	1.7	850	1.4	570
8	2.6	1,950	1.6	750	1.25	455
9	2.4	1,660	1.6	750	....	602
10	2.4	1,660	1.65	800	1.6	750
11	2.4	1,660	1.6	750	....	660
12	2.45	1,730	1.6	750	1.4	570
13	2.55	1,880	1.5	660	....	530
14	2.7	2,110	1.5	660	1.3	490
15	2.8	2,270	1.5	660	....	880
16	2.9	2,430	1.5	660	2.1	1,270
17	2.7	2,110	1.55	705	....	1,110
18	2.55	1,880	1.55	705	1.8	950
19	2.45	1,730	1.6	750	....	850
20	2.3	1,520	1.55	705	1.6	750
21	2.2	1,390	1.4	570	....	728
22	2.1	1,270	1.4	570	1.55	705
23	2.0	1,160	1.5	660	....	638
24	2.1	1,270	1.5	660	1.4	570
25	2.2	1,390	1.5	660	....	530
26	2.1	1,270	1.5	660	1.3	490
27	1.9	1,050	1.45	615	....	472
28	1.9	1,050	1.45	615	1.25	455
29	2.0	1,160	1.45	615	....	422
30	1.9	1,050	1.45	615	1.15	390
31	1.8	950	1.5	660	....	....

NOTE.—Discharge determined from a fairly well defined rating curve. Discharge interpolated for days when no gage height was reported.

Monthly discharge of Cowlitz River at Lewis, Wash., for the year ending Sept. 30, 1911.

[Drainage area, 275 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
July	2,940	950	1,740	6.33	7.30	107,000	B.
August	1,000	570	731	2.66	3.07	44,900	B.
September	1,270	390	653	2.37	2.64	38,900	B.
The period						191,000	

COWLITZ RIVER AT RANDLE, WASH.

Location.—In sec. 17, T. 12 N., R. 7 E., at the ferry at Randle, 11 miles above Cispus River.

Records available.—October 1, 1910, to September 30, 1911.

Drainage area.—519 square miles.

Gage.—Vertical staff in four sections on the right bank.

Channel.—Sand and gravel; somewhat shifting.

Discharge measurements.—Made from the ferry or by wading.

Accuracy.—Results good, except for high stages.

Discharge measurements of Cowlitz River at Randle, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 26	E. S. Fuller	4.60	2,960	Mar. 23	H. P. Gilkey	5.42	3,820
Nov. 27	H. P. Gilkey	5.75	4,260	Aug. 8	Harmon and Leidl	1.98	1,030
				Sept. 10	W. O. Harmon	2.30	1,420

Daily gage height, in feet, of Cowlitz River at Randle, Wash., for the year ending Sept. 30, 1911.

[D. C. Bishop, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.65	2.5	5.85	2.2	2.2	1.2	5.4	5.2	8.5	5.2	2.6	2.4
2	2.2	2.4	6.35	2.2	2.0	1.2	5.2	5.3	6.6	5.1	2.7	2.2
3	5.2	2.3	6.6	3.4	2.2	1.2	5.0	5.3	5.4	5.2	2.7	2.2
4	6.5	2.2	7.15	3.2	2.2	1.4	4.8	5.8	5.2	5.4	2.6	2.2
5	6.15	2.25	7.7	3.3	2.2	1.4	4.6	5.6	5.0	5.8	2.5	2.2
6	5.5	2.7	6.15	3.2	2.2	1.4	4.5	5.2	5.8	5.8	2.6	2.7
7	5.8	5.45	7.65	4.4	2.2	1.6	4.4	5.0	6.0	5.6	2.6	3.1
8	5.25	6.85	6.85	4.5	1.6	1.6	3.8	5.4	6.2	5.4	2.4	......
9	4.5	6.5	6.7	4.2	1.4	1.8	3.8	5.2	8.8	4.8	2.2	......
10	3.7	13.1	6.3	3.3	1.4	1.6	3.4	4.8	11.2	4.8	2.2	2.4
11	3.25	17.4	5.3	3.2	2.2	2.3	3.2	4.6	11.2	5.4	2.1	2.2
12	2.95	11.2	4.35	2.9	2.2	2.2	3.0	5.2	9.8	5.5	2.0	2.5
13	2.55	7.95	4.25	2.6	3.8	1.9	2.8	5.0	9.2	4.8	2.2	2.4
14	2.35	6.6	4.05	2.3	3.2	1.8	2.7	5.2	8.2	5.4	2.0	2.6
15	2.3	5.65	3.3	2.2	2.2	2.2	2.6	5.4	7.2	5.7	2.0	2.8
16	2.0	5.15	3.15	2.2	2.0	2.8	2.8	5.4	6.8	6.2	2.0	3.5
17	3.35	4.65	3.45	2.2	1.6	2.6	2.6	5.8	6.2	6.4	2.0	3.2
18	4.0	4.3	2.4	3.2	2.8	3.1	3.1	6.0	6.2	5.4	2.1	2.9
19	3.4	3.9	2.15	4.2	2.2	3.2	3.2	5.3	6.0	5.6	2.2	2.4
20	3.2	5.1	2.3	4.2	2.2	3.4	3.4	4.8	5.8	5.2	2.1	2.2
21	2.85	16.55	3.15	4.4	2.1	3.6	3.4	5.2	5.4	5.2	2.0	2.0
22	2.65	16.3	3.05	3.4	2.2	4.1	3.6	5.1	6.2	3.6	2.0	2.0
23	2.45	12.0	3.25	3.2	1.8	4.6	3.8	5.2	5.6	3.3	2.1	1.8
24	2.7	9.5	5.15	2.1	1.5	5.3	4.2	5.2	5.4	3.6	2.2	1.8
25	4.8	8.0	4.45	2.2	2.1	5.2	5.4	5.2	7.2	3.4	2.2	1.6
26	4.35	6.45	4.15	2.2	2.2	4.2	5.4	5.0	6.8	3.4	2.0	1.5
27	3.65	5.8	4.4	2.2	1.6	4.2	4.8	4.8	6.2	3.2	2.2	1.5
28	3.25	5.15	4.15	2.1	1.2	4.0	4.4	5.0	6.0	3.2	2.1	1.4
29	2.95	5.15	3.45	2.4	......	3.8	4.6	5.2	5.6	3.1	2.2	1.4
30	2.75	5.7	4.2	2.0	......	3.8	4.2	7.6	5.4	3.1	2.2	1.4
31	2.60	......	4.7	2.4	......	4.2	......	10.7	......	2.8	2.2	......

Daily discharge, in second-feet, of Cowlitz River at Randle, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	833	1,320	4,330	1,140	1,140	628	3,810	3,600	8,120	3,600	1,380	1,260
2	1,140	1,260	4,940	1,140	1,020	628	3,600	3,700	5,280	3,490	1,450	1,140
3	3,600	1,200	5,280	1,960	1,140	628	3,390	3,700	3,810	3,600	1,450	1,140
4	5,140	1,140	6,040	1,810	1,140	714	3,190	4,270	3,600	3,810	1,380	1,140
5	4,690	1,170	6,850	1,890	1,140	714	3,000	4,040	3,390	4,270	1,320	1,140
6	3,920	1,450	4,690	1,810	1,140	714	2,910	3,600	4,270	4,270	1,380	1,450
7	4,270	3,860	6,780	2,820	1,140	808	2,820	3,390	4,510	4,040	1,380	1,730
8	3,650	5,620	5,620	2,910	808	808	2,290	3,810	4,760	3,810	1,260	1,570
9	2,910	5,140	5,410	2,640	714	910	2,290	3,600	8,630	3,190	1,140	1,420
10	2,200	16,900	4,880	1,890	714	808	1,960	3,190	13,100	3,190	1,140	1,260
11	1,850	26,100	3,700	1,810	1,140	1,200	1,810	3,000	13,100	3,810	1,080	1,140
12	1,620	13,100	2,770	1,590	1,140	1,140	1,660	3,600	10,400	3,920	1,020	1,320
13	1,350	7,230	2,680	1,380	2,290	964	1,520	3,390	9,340	3,190	1,140	1,260
14	1,230	5,280	2,500	1,200	1,810	910	1,450	3,600	7,630	3,810	1,020	1,380
15	1,200	4,090	1,890	1,140	1,140	1,140	1,380	3,810	6,110	4,150	1,020	1,520
16	1,020	3,540	1,770	1,140	1,020	1,520	1,520	3,810	5,550	4,760	1,020	2,040
17	1,920	3,050	2,000	1,140	808	1,380	1,380	4,270	4,760	5,010	1,020	1,810
18	2,460	2,820	1,260	1,810	1,520	1,730	1,730	4,510	4,760	3,810	1,080	1,590
19	1,960	2,370	1,110	2,640	1,140	1,810	1,810	3,700	4,510	4,040	1,140	1,260
20	1,810	3,490	1,200	2,640	1,140	1,960	1,960	3,190	4,270	3,600	1,080	1,140
21	1,550	24,200	1,770	2,820	1,080	2,120	1,960	3,600	3,810	3,600	1,020	1,020
22	1,420	23,700	1,700	1,960	1,140	2,550	2,120	3,490	4,760	2,120	1,020	1,020
23	1,290	14,700	1,850	1,810	910	3,000	2,290	3,600	4,040	1,890	1,080	910
24	1,450	9,880	3,540	1,080	760	3,700	2,640	3,600	3,810	2,120	1,140	910
25	3,190	7,310	2,860	1,140	1,080	3,600	3,810	3,600	6,110	1,960	1,140	808
26	2,770	5,080	2,590	1,140	1,140	2,640	3,810	3,390	5,550	1,960	1,020	760
27	2,160	4,270	2,820	1,140	808	2,640	3,190	3,190	4,760	1,810	1,140	760
28	1,850	3,540	2,590	1,080	628	2,460	2,820	3,390	4,510	1,810	1,080	714
29	1,620	3,540	2,000	1,260	......	2,290	3,000	3,600	4,040	1,730	1,140	714
30	1,480	4,150	2,640	1,020	......	2,290	2,640	6,700	3,810	1,730	1,140	714
31	1,380	......	3,100	1,260	......	2,640	......	12,100	......	1,520	1,140	......

Note.—Discharge determined from a rating curve well defined below 6,000 second-feet.

Monthly discharge of Cowlitz River at Randle, Wash., for the year ending Sept. 30, 1911.

[Drainage area, 519 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	5,140	833	2,220	4.28	4.93	136,000	A.
November	26,100	1,140	7,020	13.5	15.06	418,000	C.
December	6,850	1,110	3,330	6.42	7.40	205,000	A.
January	2,910	1,020	1,680	3.24	3.74	103,000	A.
February	2,290	628	1,100	2.12	2.21	61,100	A.
March	3,700	628	1,650	3.18	3.67	101,000	A.
April	3,810	1,380	2,460	4.74	5.29	146,000	A.
May	12,100	3,000	4,000	7.71	8.89	246,000	B.
June	13,100	3,390	5,840	11.3	12.61	348,000	B.
July	5,010	1,520	3,210	6.18	7.12	197,000	A.
August	1,450	1,020	1,160	2.24	2.58	71,300	A.
September	2,040	714	1,200	2.31	2.58	71,400	A.
The year	26,100	628	2,910	5.61	76.08	2,100,000	

COWLITZ RIVER AT MAYFIELD, WASH.

Location.—In sec. 21, T. 12 N., R. 1 E., at the highway bridge at Mayfield, about 4 miles below Tilton River.

Records available.—August 25, 1910, to September 30, 1911.

Drainage area.—1,320 square miles.

Gage.—Vertical staff on left bank at the bridge.

Channel.—Rocky; practically permanent.

Discharge measurements.—Made from the highway bridge at the gage, or from the bridge at Mossy Rock, about 7 miles above the gage. When made from the latter, Tilton River is measured and added.

Accuracy.—Gage heights not reliable on account of difficulty of reading from the high bridge. Measuring conditions poor. Results not reliable.

Discharge measurements of Cowlitz River at Mayfield, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Aug. 25	C. W. Harris	1.20	1,330	July 9[a]	G. L. Parker	5.85	4,510
				Aug. 25[a]	do	1.80	1,690

[a] Measured at Mossy Rock bridge; discharge includes Tilton River.

Daily gage height, in feet, of Cowlitz River at Mayfield, Wash., for Aug. 25, 1910, to Sept. 30, 1911.

[J. B. Justice, observer.]

Day.	Aug.	Sept.	Oct.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	1.1	1.4	9.0	7.6	5.0	4.2	6.4	8.0	15.0	7.0	2.5	2.0
2	......	1.15	3.4	9.4	7.5	5.0	4.2	6.8	7.7	14.0	7.0	2.5	2.0
3	......	1.05	6.4	12.0	7.5	5.0	4.2	7.0	9.0	12.0	7.0	2.5	2.2
4	......	1.1	......	13.2	7.5	5.0	4.1	7.0	13.0	11.2	7.5	2.5	2.2
5	......	1.1	......	13.0	7.4	5.0	4.2	7.0	14.0	10.0	7.5	2.5	2.1
6	......	1.1	......	13.0	8.0	5.0	4.0	6.2	12.0	9.6	7.5	2.5	2.0
7	......	1.1	......	12.4	8.0	5.0	4.0	6.2	11.0	9.4	7.5	2.5	2.0
8	......	1.05	......	11.6	8.0	5.0	4.0	6.2	10.4	8.2	7.0	2.5	2.0
9	......	1.0	......	13.4	8.0	5.0	4.0	6.2	10.2	8.0	5.8	2.5	2.8
10	......	1.0	......	14.2	8.0	5.0	4.0	6.2	9.0	10.0	6.0	2.5	3.4
11	......	1.0	......	14.0	8.2	5.0	4.0	6.2	8.2	12.0	5.5	2.5	3.6
12	......	.9	......	13.0	8.0	5.0	4.0	6.0	8.4	13.4	5.0	2.5	3.4
13	......	.8	......	9.4	8.0	4.9	5.0	6.0	9.0	15.0	5.0	2.3	3.2
14	......	.6	......	9.0	8.0	4.9	5.4	6.0	9.0	14.0	6.0	2.3	3.0
15	......	.5	......	8.0	8.0	4.9	5.9	6.0	9.0	13.0	6.0	2.0	3.0
16	......	.9	......	8.0	8.0	4.9	6.0	5.5	9.2	12.0	6.0	2.0	3.4
17	......	1.0	......	8.0	8.0	4.9	6.4	5.5	10.0	10.8	6.0	2.0	4.6
18	......	1.0	......	7.9	8.0	4.9	6.9	6.0	12.0	10.0	5.5	2.0	4.0
19	......	1.0	......	7.9	8.0	4.9	7.0	6.0	12.0	9.0	5.0	2.0	3.2
20	......	1.1	......	7.8	8.0	4.9	7.0	6.0	11.0	8.0	4.5	2.0	3.1
21	......	1.1	......	7.8	8.0	4.9	7.2	6.0	10.6	8.0	4.0	2.0	3.1
22	......	1.1	......	7.8	8.0	4.9	7.8	6.0	11.0	8.0	4.0	2.0	2.6
23	......	1.2	......	7.8	7.4	4.7	8.0	6.0	10.4	7.5	4.0	2.0	2.0
24	......	1.2	......	7.8	7.2	4.6	8.0	7.0	9.4	7.0	4.0	2.0	2.0
25	1.2	1.0	......	7.9	7.0	4.6	8.0	10.0	8.4	7.0	3.8	2.0	2.0
26	1.1	.9	......	7.8	7.0	4.6	8.0	9.7	8.2	7.2	3.5	2.0	2.0
27	1.1	.9	......	7.7	7.0	4.4	7.0	9.0	8.0	8.0	3.5	2.0	2.0
28	1.1	.9	......	7.7	7.0	4.2	7.0	8.4	8.4	8.8	3.5	2.0	2.0
29	1.15	1.1	......	7.6	7.4	......	6.5	8.2	9.0	7.5	3.0	2.0	2.0
30	1.0	1.2	......	7.6	7.4	......	6.5	8.0	10.4	7.0	3.0	2.0	2.0
31	1.1	......	......	7.6	6.5	......	6.5	......	12.0	......	3.0	2.0	......

NOTE.—Water over gage Oct. 4, 1910. No records Oct. 4 to Mar. 30.

Daily discharge, in second-feet, of Cowlitz River at Mayfield, Wash., for Aug. 25, 1910, to Sept. 30, 1911.

Day.	Aug.	Sept.	Oct.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	1,310	1,460	7,000	5,580	3,800	3,160	4,920	6,200	12,500	5,400	2,070	1,770
2	......	1,340	2,610	7,400	5,800	3,800	3,160	5,240	5,960	11,500	5,400	2,070	1,770
3	......	1,280	4,920	9,700	5,800	3,800	3,160	5,400	7,000	9,700	5,400	2,070	1,890
4	......	1,310	......	10,800	5,800	3,800	3,090	5,400	10,600	9,000	5,800	2,070	1,890
5	......	1,310	......	10,600	5,720	3,800	3,160	5,400	11,500	7,900	5,800	2,070	1,830
6	......	1,310	......	10,600	6,200	3,800	3,020	4,760	9,700	7,500	5,800	2,070	1,770
7	......	1,310	......	10,100	6,200	3,800	3,020	4,760	8,800	7,400	5,800	2,070	1,770
8	......	1,280	......	9,300	6,200	3,800	3,020	4,760	8,300	6,360	5,400	2,070	1,770
9	......	1,260	......	11,000	6,200	3,800	3,020	4,760	8,100	6,200	4,440	2,070	2,260
10	......	1,260	......	11,700	6,200	3,800	3,020	4,760	7,000	7,900	4,600	2,070	2,610
11	......	1,260	......	11,500	6,360	3,800	3,020	4,760	6,360	9,700	4,200	2,070	2,740
12	......	1,210	......	10,600	6,200	3,800	3,020	4,600	6,520	11,000	3,800	2,070	2,610
13	......	1,160	......	7,400	6,200	3,720	3,800	4,600	7,000	12,500	3,800	1,950	2,490
14	......	1,080	......	7,000	6,200	3,720	4,120	4,600	7,000	11,500	4,600	1,950	2,370
15	......	1,040	......	6,200	6,200	3,720	4,520	4,600	7,000	10,600	4,600	1,770	2,370
16	......	1,210	......	6,200	6,200	3,720	4,600	4,200	7,200	9,700	4,600	1,770	2,610
17	......	1,260	......	6,200	6,200	3,720	4,920	4,200	7,900	8,600	4,600	1,770	3,480
18	......	1,260	......	6,120	6,200	3,720	5,320	4,600	9,700	7,900	4,200	1,770	3,020
19	......	1,260	......	6,120	6,200	3,720	5,400	4,600	9,700	7,000	3,800	1,770	2,490
20	......	1,310	......	6,040	6,200	3,720	5,400	4,600	8,800	6,200	3,400	1,770	2,430
21	......	1,310	......	6,040	6,200	3,720	5,560	4,600	8,400	6,200	3,020	1,770	2,430
22	......	1,310	......	6,040	6,200	3,720	6,040	4,600	8,800	6,200	3,020	1,770	2,130
23	......	1,360	......	6,040	5,720	3,560	6,200	4,600	8,300	5,800	3,020	1,770	1,770
24	......	1,360	......	6,040	5,560	3,480	6,200	5,400	7,400	5,400	3,020	1,770	1,770
25	1,360	1,260	......	6,120	5,400	3,480	6,200	7,900	6,520	5,400	2,880	1,770	1,770
26	1,310	1,210	......	6,040	5,400	3,480	6,200	7,600	6,360	5,560	2,670	1,770	1,770
27	1,310	1,210	......	5,960	5,400	3,320	5,400	7,000	6,200	6,200	2,670	1,770	1,770
28	1,310	1,210	......	5,960	5,400	3,160	5,400	6,520	6,520	6,840	2,670	1,770	1,770
29	1,340	1,310	......	5,880	5,720	......	5,000	6,360	7,000	5,800	2,370	1,770	1,770
30	1,260	1,360	......	5,880	5,720	......	5,000	6,200	8,300	5,400	2,370	1,770	1,770
31	1,310	......	......	5,880	5,000	......	5,000	......	9,700	......	2,370	1,770	......

NOTE.—Discharge determined from a poorly defined rating curve.

Monthly discharge of Cowlitz River at Mayfield, Wash., for the year ending Sept. 30, 1911.

[Drainage area, 1,320 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
December	11,700	5,880	7,660	5.80	6.69	471,000	B.
January	6,360	5,000	5,930	4.49	5.18	365,000	B.
February	3,800	3,160	3,690	2.80	2.92	205,000	B.
March	6,200	3,020	4,430	3.36	3.87	272,000	B.
April	7,900	4,200	5,210	3.95	4.41	310,000	B.
May	11,500	5,960	7,870	5.96	6.87	484,000	B.
June	12,500	5,400	7,980	6.05	6.75	475,000	B.
July	5,800	2,370	4,050	3.07	3.54	249,000	B.
August	2,070	1,770	1,900	1.44	1.66	117,000	B.
September	3,480	1,770	2,160	1.64	1.83	129,000	B.
The period						3,080,000	

CLEAR FORK OF COWLITZ RIVER NEAR LEWIS, WASH.

Location.—In sec. 29, T. 14 N., R. 10 E., just above the crossing of the Yakima Valley trail, 1,000 feet above the mouth and about 7 miles northeast of Lewis.

Records available.—August 21, 1907, to September 30, 1911.

Drainage area.—48 square miles.

Gage.—Vertical staff.

Channel.—Rocks and coarse gravel; shifting in floods.

Discharge measurements.—Made from a cable or by wading near the gage.

Accuracy.—Results poor prior to 1911, but fair for 1911.

Cooperation.—Field data furnished by the Valley Development Co.

Discharge measurements of Clear Fork of Cowlitz River near Lewis, Wash., in 1907-1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*	1910.		*Feet.*	*Sec.-ft.*
1907.				Oct. 30		1.10	125
Aug. 21		0.50	103	Nov. 24		2.40	371
Nov. 22	J. C. Stevens	1.15	177	1911.			
1910.				May 31		2.90	590
Aug. 27	C. W. Harris	[a].60	95.0	June 13		3.35	862
Oct. 30		1.10	160	29		1.90	338
30		1.10	142	Oct. 6	G. L. Parker	.57	73

[a] Gage height is observer's reading for the day.

NOTE.—Discharge measurements of Aug. 21, 1907, Oct. 30, and Nov. 24, 1910, May 31, June 13, and 29 were made by employees of the Valley Development Co.

Daily gage height, in feet, and discharge, in second-feet, of Clear Fork of Cowlitz River near Lewis, Wash., for the year ending Sept. 30, 1907.

Day.	August.		September.		Day.	August.		September.	
	Gage height.	Discharge.	Gage height.	Discharge.		Gage height.	Discharge.	Gage height.	Discharge.
1	....	....	0.5	92	16	....	....	1.0	165
2	....	....	.6	104	17	....	....	.8	132
3	....	....	.5	92	18	....	....	.7	117
4	....	....	.5	92	19	....	....	.6	104
5	....	....	.5	92	20	0.5	92	.5	92
6	....	....	.4	81	21	.5	92	.4	81
7	....	....	.4	81	22	.5	92	.5	92
8	....	....	.4	81	23	.5	92	.4	81
9	....	....	.4	81	24	.6	104	.4	81
10	....	....	.4	81	25	.6	104	.4	81
11	....	....	.4	81	26	.6	104	.3	71
12	....	....	.4	81	27	.5	92	.4	81
13	....	....	.3	71	28	.5	92	.4	81
14	....	....	.3	71	29	.5	92	.4	81
15	....	....	.4	81	30	.4	81	.3	71
					31	.4	81	....	....

Daily gage height, in feet, of Clear Fork of Cowlitz River near Lewis, Wash., for the years ending Sept. 30, 1908–1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1907–8.												
1	0.3	0.3	....	1.1	0.3	0.65	0.8	1.9	1.6	2.9	1.1	0.4
2	.3	.5	1.6	1.0	.4	.65	.75	2.0	1.55	2.8	1.1	.4
3	.3	.4	1.5	.95	.4	.65	.8	1.8	1.5	2.6	.95	.4
4	.3	.3	1.5	.9	.45	.6	.7	1.7	1.5	2.5	.9	.4
5	.3	.3	1.5	.9	.5	.55	.7	1.6	1.5	2.3	.95	.4
6	.3	.3	1.4	.9	.65	.5	.7	1.8	1.7	2.2	.95	.35
7	.3	.3	1.3	.95	.55	.5	.6	2.3	2.2	2.4	.9	.35
8	.3	.3	1.2	1.0	.55	.45	.6	2.1	2.7	2.5	.9	.35
9	.2	.3	1.1	1.0	.55	.45	.6	1.8	2.9	2.4	.8	.3
10	.2	.3	1.1	1.0	.5	.45	.6	1.7	3.1	2.4	.8	.3
11	.2	.2	1.0	.95	.5	.5	.7	1.5	3.2	2.2	.8	.3
12	.2	.2	1.0	.9	.45	.8	.8	1.4	2.9	2.2	.75	.3
13	.2	.2	1.2	.85	.45	2.1	1.2	1.3	2.7	2.6	.7	.3
14	.2	.2	1.0	.8	.4	2.6	1.25	1.2	2.9	2.2	.75	.3
15	.2	.2	.9	.75	.45	5.0	1.3	1.3	3.2	2.1	.7	.3
16	.2	.3	.8	.8	.5	5.0	1.3	1.3	2.6	2.1	.75	.25
17	.2	.3	.8	.8	.7	2.8	1.4	1.2	2.4	1.9	.75	.2
18	.2	.2	.7	.75	.7	2.1	2.6	1.4	2.3	1.9	.7	.2
19	.2	.2	.7	.75	.75	1.75	3.0	1.5	2.1	1.9	.7	.2
20	.2	.4	.7	.8	.7	1.5	3.4	1.5	1.9	1.9	.7	.2
21	.2	.8	1.15	.8	.6	1.3	2.5	1.5	1.7	2.0	.65	.15
22	.2	1.1	1.3	.7	.55	1.55	2.1	1.6	1.7	1.8	.6	.15
23	.1	.6	2.6	.65	.55	1.55	1.9	1.65	1.7	1.8	.6	.1
24	.1	....	3.2	.6	.55	1.6	2.1	2.0	1.95	1.7	.55	.1
25	.1	....	2.5	.55	.55	1.3	1.8	2.1	2.5	1.5	.55	.1
26	.1	....	2.3	.55	.8	1.2	1.6	1.9	2.4	1.3	.5	.1
27	.1	1.4	2.1	.55	.95	1.1	1.6	1.7	2.2	1.2	.4	.1
28	.1	1.6	1.6	.5	.95	1.0	1.4	1.75	2.1	1.1	.8	.1
29	.3	....	1.4	.5	.5	1.0	1.4	1.9	2.0	1.0	.65	.1
30	.3	....	1.2	.45	....	.9	1.5	1.7	2.4	1.1	.55	.1
31	.3	....	1.1	.3	....	.8	....	1.6	....	1.1	.5	....
1908–9.												
1	.25	1.2	.6	.45	.6	.65	.95	1.05	3.1	1.95	.7	.2
2	.2	1.0	.5	.5	.55	.55	.9	1.3	3.5	1.7	.65	.2
3	.1	1.15	.5	.65	.65	.55	.8	1.75	3.1	1.85	.6	.2
4	.1	.9	.45	1.1	.6	.6	.7	2.3	2.8	1.7	.7	.2
5	.1	.3	.4	.9	.6	.55	.7	1.9	2.6	1.65	.65	.2
6	.1	.55	.35	.7	.6	.55	.65	1.6	2.4	1.7	.5	.2
7	.1	.45	.35	.7	.55	.55	.55	1.3	2.25	1.6	.6	.15
8	.7	.9	.4	.6	.5	.55	.55	1.3	2.15	1.45	.5	.15
9	.7	.35	.35	.6	.5	.5	.55	1.35	2.25	1.55	.5	.15
10	.7	.3	.3	.55	.45	.45	.6	1.3	2.4	1.5	.5	.2

Daily gage height, in feet, of Clear Fork of Cowlitz River near Lewis, Wash., for the years ending Sept. 30, 1908–1911—Continued.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1908-9—Con.												
11	0.7	0.25	0.3	0.5	0.4	0.4	0.6	1.2	2.6	1.8	0.45	0.2
12	.7	.2	.5	.4	.4	.4	.65	1.2	2.6	1.45	.45	.1
13	.35	.2	.6	.4	.4	.4	.7	1.2	2.4	1.25	.4	.1
14	.5	.6	.5	.35	.35	.45	.75	1.15	2.2	1.2	.4	.1
15	.55	.15	.4	.35	.45	.5	.75	1.15	2.6	1.3	.4	.05
16	.35	.3	.35	.6	.95	.5	.7	1.25	2.4	1.3	.35	.05
17	.3	1.1	.3	1.0	1.4	.55	.7	1.25	2.3	1.1	.3	.1
18	.25	2.6	2	1.3	1.3	.55	.7	1.3	2.2	1.0	.35	.05
19	.3	1.6	.2	2.3	1.2	.55	.65	1.4	2.2	.95	.4	.05
20	.2	1.6	.2	3.1	1.0	.5	.7	1.4	2.1	.95	.4	.3
21	.2	1.5	.2	2.85	.9	.45	.6	1.3	2.0	1.0	.3	.65
22	.1	1.45	.2	2.9	.75	.45	.6	1.3	1.85	1.05	.3	.35
23	.1	1.1	.25	1.55	.7	.45	.7	1.3	1.9	1.1	.25	.3
24	.15	1.1	.25	1.3	.75	.45	.7	1.5	1.85	1.0	.2	.2
25	.15	.9	.4	1.15	.7	.45	.7	1.75	1.85	1.0	.2	.3
26	.2	.75	.75	1.0	.65	.5	1.4	2.1	1.85	.9	.5	.2
27	.2	.7	.85	.9	.7	.6	1.35	2.0	1.8	.8	.3	.2
28	.25	.65	1.0	.75	.4	.6	1.3	2.4	1.8	.8	.2	.15
29	.6	.65	.8	.7	......	.7	1.2	2.1	1.5	8	2	.25
30	.95	.7	.6	.7	......	.65	1.05	2.0	1.6	.85	.2	.25
31	1.8	......	.55	.65	......	.75	......	2.3	......	.75	.2	......
1909-10.												
1	.2	.3	3.35	1.1	1 65	......	1.6	2.15	3.0	1.65	1.0	.6
2	.15	4.7	2.8	1.0	1.5	......	1.55	2.05	2.45	1.65	.95	.6
3	.1	5.0	2.4	.9	1.45	......	1.5	2.1	2.2	1.6	.95	.6
4	.05	2.8	2.1	.85	1.35	......	1.45	2.2	2.1	1.6	.95	.6
5	.5	2.1	1.9	.85	1.3	......	1.45	2.25	2.25	1.6	.9	.6
6	.6	1.6	1.8	.85	1.3	......	1.55	2.3	2.15	1.6	1.0	6
7	.35	1.3	1.7	.8	1.2	......	1.55	2.9	2.0	1.6	.9	.6
8	.2	1.3	1.65	.8	1.1	......	1.6	3.1	1.9	1.65	.9	.6
9	.55	1.1	1.6	.75	1.1	......	1.65	3.15	1.9	1.6	.9	.55
10	.45	1 1	1.5	.75	1.0	......	1.65	3.9	2.1	1.65	.9	.55
11	.3	.9	1.5	.7	1.0	......	1.8	3.7	3.2	1.65	.8	.55
12	.2	.8	2.4	.7	1.0	......	2.0	3.25	2.5	1.6	.8	.55
13	.2	.75	2.4	.7	1.1	......	2.0	2.9	2.15	1.65	8	.55
14	.2	.6	2.1	7	1.0	2.8	1.85	2.7	2 15	1.4	.8	.55
15	.1	.5	1.9	.65	.9	2.6	1.75	2.5	2.1	1.45	.75	.55
16	.1	.5	1.8	.65	.85	2.7	1.75	2.4	2.15	1.4	.75	.55
17	.05	.5	1.65	.65	.8	2.8	1.8	2.5	2.0	1.3	.7	.6
18	.05	3.1	1.6	.75	.75	3.0	1.9	2.7	1.9	1.25	.8	.6
19	.05	4.5	1.5	.75	.75	3.4	2.2	2.6	2.1	1.25	.8	.55
20	.1	2.7	1.45	.7	.7	3.0	2.95	2.4	2.0	1.25	.75	.6
21	.2	1.1	1.4	.8	.7	3.1	2.65	2.3	1.8	1.25	.75	.6
22	.15	3.2	1.3	1.9	.9	3.0	2.55	2.3	1.7	1.25	.7	.6
23	.05	7.3	1.25	2.6	.95	2.85	2.75	2.95	1.65	1.1	.7	.6
24	.3	5.0	1.2	3.0	1.25	2.75	3.5	3.25	1.7	1.0	.6	.6
25	.2	3.65	1.2	2.4	1.65	2.6	3.7	3.1	1.8	1.0	.6	.55
26	.1	2.9	1.15	2.0	1.6	2.1	3.8	2.9	1.9	1.1	.6	.5
27	.05	2.55	1.15	1.7	1.75	2.0	3.15	2.7	1.8	1.0	.6	.5
28	.05	2.8	1.1	1.7	1.6	1.8	2.85	2.4	1.7	1.0	.6	.5
29	.1	6.3	1.1	1.65	......	1.7	2.45	2.5	1.65	1.05	.6	.65
30	.05	4.6	1.25	1.6	......	1.65	2.3	2.7	1.65	1.0	.6	.6
31	.1	......	1.1	1.8	......	1.6	......	2.8	......	1.0	.6	......
1910-11.												
1	.85	1.05	1.6	1.1	.85	.45	1.5	1.7	3.3	1.85	.95	.6
2	.65	1.0	1.8	1.05	.8	.45	1.5	1.9	3.1	1.85	.95	.6
3	3.4	1.1	1.85	1.05	.75	.5	1.4	2.0	2.7	1.95	.95	.6
4	2.65	1.0	1.9	1.0	.75	.55	1.3	2.2	2.5	2.0	.9	.6
5	2.0	.95	1.8	1.05	.75	.55	1.2	2.25	2.1	1.9	.9	.75
6	1.9	1.15	1.6	1.15	.75	.55	1.1	2.1	2.2	1.9	.9	.65
7	1.9	2.0	1.8	1.45	.7	.6	1.05	1.9	2.3	1.95	.9	.7
8	1.65	2.0	1.7	1.4	.7	.6	1.1	1.9	2.3	1.65	.85	.6
9	1.65	1.7	1.5	1.35	.7	.6	1.1	1.85	2.3	1.5	.8	......
10	1.25	......	1.4	1.2	.7	.6	1.1	1.7	2.6	1.55	.8	1.0
11	1.2	3.7	1.4	1.15	.7	.6	1.1	1.65	3.1	1.55	.8	......
12	1.1	2.8	1.4	1.1	.65	.55	1.0	1.75	3.4	1.6	.8	.9
13	1.0	2.3	1.3	.95	.65	.55	1.0	1.75	3.35	1.6	.8	......
14	1.0	2.0	1.3	.9	.65	.55	.95	1.65	3.1	1.7	.75	.7
15	.95	1.85	1.3	.9	.6	.65	1.0	1.7	3.95	1.7	.7	......

Daily gage height, in feet, of Clear Fork of Cowlitz River near Lewis, Wash., for the years ending Sept. 30, 1908–1911—Continued.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1910-11—Con.												
16	0.95	1.7	1.2	0.9	0.55	0.75	1.05	2.1	2.8	1.8	0.7	1.45
17	2.25	1.5	1.15	.95	.6	1.3	.95	2.1	2.7	1.6	.7	......
18	1.75	1.4	1.15	.95	.6	.9	1.1	2.2	2.6	1.55	.7	1.15
19	1.6	1.35	1.1	1.0	.6	.95	1.0	2.15	2.3	1.45	.7	......
20	1.25	1.95	1.1	.95	.6	1.1	1.0	2.0	2.15	1.3	.7	1.0
21	1.1	......	1.1	.9	.6	1.3	1.1	2.0	2.15	1.3	.7	......
22	1.1	......	1.05	.85	.55	1.4	1.2	2.25	2.4	1.2	.7	.95
23	1.0	3.0	1.3	.8	.5	1.7	1.3	2.05	2.1	1.2	.7	......
24	1.4	2.5	1.45	.8	.5	1.6	1.55	1.95	1.85	1.2	.65	.8
25	2.6	2.15	1.4	.8	.55	1.5	2.1	1.8	1.8	1.25	.65	......
26	1.9	1.9	1.3	.75	.55	1.4	1.9	1.75	1.9	1.15	.6	.7
27	1.4	1.8	1.3	.75	.5	1.25	1.8	1.7	2.4	1.05	.6	......
28	1.3	1.6	1.2	.75	.5	1.1	1.6	1.75	2.15	1.05	.6	.65
29	1.2	1.6	1.15	.7	......	1.05	......	1.95	1.95	1.0	.55	......
30	1.1	1.6	1.2	.75	......	1.05	......	2.35	1.85	1.0	.55	.6
31	1.05	......	1.1	.75	......	1.2	......	2.9	......	1.0	.6	......

Daily discharge, in second-feet, of Clear Fork of Cowlitz River near Lewis, Wash., for the years ending Sept. 30, 1908–1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1907-8.												
1	71	71	360	183	71	110	132	361	288	652	183	81
2	71	92	288	165	81	110	124	386	277	620	183	81
3	71	81	266	156	81	110	132	336	266	558	156	81
4	71	71	266	148	86	104	117	312	266	528	148	81
5	71	71	266	148	92	98	117	288	266	468	156	81
6	71	71	244	148	110	92	117	336	312	440	156	76
7	71	71	223	156	98	92	104	468	440	498	148	76
8	71	71	203	165	98	86	104	412	589	528	148	76
9	62	71	183	165	98	86	104	336	652	498	132	71
10	62	71	183	165	92	86	104	312	718	498	132	71
11	62	62	165	156	92	92	117	266	752	440	132	71
12	62	62	165	148	86	132	132	244	652	440	124	71
13	62	62	203	140	86	412	203	223	589	558	117	71
14	62	62	165	132	81	558	213	203	652	440	124	71
15	62	62	148	124	86	1,480	223	223	752	412	117	71
16	62	71	132	132	92	1,480	223	223	558	412	124	66
17	62	71	132	132	117	620	244	203	498	361	124	62
18	62	62	117	124	117	412	558	244	468	361	117	62
19	62	62	117	124	124	324	685	266	412	361	117	62
20	62	81	117	132	117	266	823	266	361	361	117	62
21	62	71	193	132	104	223	528	266	312	386	110	58
22	62	183	223	117	98	277	412	288	312	336	104	58
23	53	104	558	110	98	277	361	300	312	336	104	53
24	53	200	752	104	98	288	412	386	374	312	98	53
25	53	310	528	98	98	223	336	412	528	266	98	53
26	53	440	468	98	132	203	288	361	498	223	92	53
27	53	244	412	98	156	183	288	312	440	203	81	53
28	53	288	288	92	156	165	244	324	412	183	132	53
29	71	950	244	92	92	165	244	361	386	165	110	53
30	71	500	203	86	......	148	266	312	498	183	98	53
31	71	......	183	71	......	132	......	288	......	183	92	......
1908-9.												
1	66	203	104	86	104	110	156	174	718	374	117	62
2	62	165	92	92	98	98	148	223	860	312	110	62
3	53	193	92	110	[illegible]	[illegible]	[illegible]	324	718	348	104	62
4	53	148	86	183	[illegible]	[illegible]	[illegible]	468	620	312	117	62
5	53	71	81	148	[illegible]	[illegible]	[illegible]	[illegible]	558	300	110	62
6	53	98	76	117	[illegible]	[illegible]	[illegible]	[illegible]	498	312	92	62
7	53	86	76	117	[illegible]	[illegible]	[illegible]	[illegible]	454	288	104	58
8	117	148	81	104	[illegible]	[illegible]	[illegible]	[illegible]	426	255	92	58
9	117	76	76	104	[illegible]	[illegible]	[illegible]	[illegible]	454	277	92	58
10	117	71	71	98	[illegible]	[illegible]	[illegible]	[illegible]	498	266	92	62

Daily discharge, in second-feet, of Clear Fork of Cowlitz River near Lewis, Wash., for the years ending Sept. 30, 1908–1911—Continued.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1908–9—Con.												
11	117	66	71	92	81	81	104	203	558	336	86	62
12	117	62	92	81	81	81	110	203	558	255	86	53
13	76	62	104	81	81	81	117	203	498	213	81	53
14	92	104	92	76	76	86	124	193	440	203	81	53
15	98	58	81	76	86	92	124	193	558	223	81	49
16	76	71	76	104	156	92	117	213	498	223	76	49
17	71	183	71	165	244	98	117	213	468	183	71	53
18	66	558	62	223	223	98	117	223	440	165	76	49
19	71	288	62	468	203	98	110	244	440	156	81	49
20	62	288	62	718	165	92	117	244	412	156	81	71
21	62	266	62	636	148	86	104	223	386	165	71	110
22	53	255	62	652	124	86	104	223	348	174	71	76
23	53	183	66	277	117	86	117	223	361	183	66	71
24	58	183	66	223	124	86	117	266	348	165	62	62
25	58	148	81	193	117	86	117	324	348	165	62	71
26	62	124	124	165	110	92	244	412	348	148	92	62
27	62	117	140	148	117	104	234	386	336	132	71	62
28	66	110	165	124	81	104	223	498	336	132	62	58
29	104	110	132	117	......	117	203	412	266	132	62	66
30	156	117	104	117	......	110	174	386	288	140	62	66
31	336	......	98	110	......	124	......	468	......	124	62	......
1909–10.												
1	62	71	804	153	276	650	263	408	680	276	135	77
2	58	1,350	612	135	239	1,060	251	380	500	276	126	77
3	53	1,480	484	118	228	980	239	394	423	263	126	77
4	49	620	394	110	205	550	228	423	394	263	126	77
5	92	412	339	110	194	420	228	438	438	263	118	77
6	104	288	313	110	194	370	251	453	408	263	135	77
7	76	223	288	103	173	290	251	646	366	263	118	77
8	62	223	276	103	153	310	263	714	339	276	118	77
9	98	183	263	96	153	310	276	732	339	263	118	72
10	86	183	239	96	135	290	276	1,020	394	276	118	72
11	71	148	239	89	135	340	313	940	750	276	103	72
12	62	132	484	89	135	390	366	768	515	263	103	72
13	62	124	484	89	153	480	366	646	408	276	103	72
14	62	104	394	89	135	612	326	579	408	216	103	72
15	53	92	339	83	118	547	300	515	394	228	96	72
16	53	92	313	83	110	579	300	484	408	216	96	72
17	49	92	276	83	103	612	313	515	366	194	89	77
18	49	718	263	96	96	680	339	579	339	184	103	77
19	49	1,270	239	96	96	822	423	547	394	184	103	72
20	53	589	228	89	89	680	663	484	366	184	96	77
21	62	183	216	103	89	714	563	453	313	184	96	77
22	58	752	194	339	118	680	531	453	288	184	89	77
23	49	2,530	184	547	126	629	596	663	276	153	89	77
24	71	1,480	173	680	184	596	860	768	288	135	77	77
25	62	920	173	484	276	547	940	714	313	135	77	72
26	53	646	163	366	263	394	980	646	339	153	77	66
27	49	531	163	288	300	366	732	579	313	135	77	66
28	49	612	153	288	263	313	629	484	288	135	77	66
29	53	2,060	153	276	......	288	500	515	276	144	77	83
30	49	1,310	184	263	......	276	453	579	276	135	77	77
31	53	......	153	313	......	263	......	612	......	135	77	......
1910–11.												
1	110	144	263	153	110	61	239	288	786	326	126	77
2	83	135	313	144	103	61	239	339	714	326	126	77
3	822	153	326	144	96	66	216	366	579	352	126	77
4	563	135	339	135	96	72	194	423	515	366	118	77
5	366	126	313	144	96	72	173	438	394	339	118	96
6	339	163	263	163	96	72	153	394	423	339	118	83
7	339	366	313	228	89	77	144	339	453	352	118	89
8	276	366	288	216	89	77	153	339	453	276	110	77
9	276	288	239	205	89	77	153	326	453	239	103	106
10	184	614	116	173	89	77	153	288	547	251	103	135
11	173	940	216	163	89	77	153	276	714	251	103	126
12	153	612	216	153	83	72	135	300	822	263	103	118
13	135	453	194	126	83	72	135	300	804	263	103	104
14	135	366	194	118	83	72	126	276	714	288	96	89
15	126	326	194	118	77	83	135	288	1,040	288	89	110

Daily gage height, in feet, of Clear Fork of Cowlitz River near Lewis, Wash., for the years ending Sept. 30, 1908-1911—Continued.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1910-11—Con.												
16	0.95	1.7	1.2	0.9	0.55	0.75	1.05	2.1	2.8	1.8	0.7	1.45
17	2.25	1.5	1.15	.95	.6	1.3	.95	2.1	2.7	1.6	.7	....
18	1.75	1.4	1.15	.95	.6	.9	1.1	2.2	2.6	1.55	.7	1.15
19	1.6	1.35	1.1	1.0	.6	.95	1.0	2.15	2.3	1.45	.7	....
20	1.25	1.95	1.1	.95	.6	1.1	1.0	2.0	2.15	1.3	.7	1.0
21	1.1	....	1.1	.9	.6	1.3	1.1	2.0	2.15	1.3	.7	....
22	1.1	....	1.05	.85	.55	1.4	1.2	2.25	2.4	1.2	.7	.95
23	1.0	3.0	1.3	.8	.5	1.7	1.3	2.05	2.1	1.2	.7	....
24	1.4	2.5	1.45	.8	.5	1.6	1.55	1.95	1.85	1.2	.65	.8
25	2.6	2.15	1.4	.8	.55	1.5	2.1	1.8	1.8	1.25	.65	....
26	1.9	1.9	1.3	.75	.55	1.4	1.9	1.75	1.9	1.15	.6	.7
27	1.4	1.8	1.3	.75	.5	1.25	1.8	1.7	2.4	1.05	.6	....
28	1.3	1.6	1.2	.75	.5	1.1	1.6	1.75	2.15	1.05	.6	.65
29	1.2	1.6	1.15	.7	....	1.05	....	1.95	1.95	1.0	.55	....
30	1.1	1.6	1.2	.75	....	1.05	....	2.35	1.85	1.0	.55	.6
31	1.05	....	1.1	.75	....	1.2	....	2.9	....	1.0	.6	....

Daily discharge, in second-feet, of Clear Fork of Cowlitz River near Lewis, Wash., for the years ending Sept. 30, 1908-1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1907-8.												
1	71	71	360	183	71	110	132	361	288	652	183	81
2	71	92	288	165	81	110	124	386	277	620	183	81
3	71	81	266	156	81	110	132	336	266	558	156	81
4	71	71	266	148	86	104	117	312	266	528	148	81
5	71	71	266	148	92	98	117	288	266	468	156	81
6	71	71	244	148	110	92	117	336	312	440	156	76
7	71	71	223	156	98	92	104	468	440	498	148	76
8	71	71	203	165	98	86	104	412	589	528	148	76
9	62	71	183	165	98	86	104	336	652	498	132	71
10	62	71	183	165	92	86	104	312	718	498	132	71
11	62	62	165	156	92	92	117	266	752	440	132	71
12	62	62	165	148	86	132	132	244	652	440	124	71
13	62	62	203	140	86	412	203	223	589	558	117	71
14	62	62	165	132	81	558	213	203	652	440	124	71
15	62	62	148	124	86	1,480	223	223	752	412	117	71
16	62	71	132	132	92	1,480	223	223	558	412	124	66
17	62	71	132	132	117	620	244	203	498	361	124	62
18	62	62	117	124	117	412	558	244	468	361	117	62
19	62	62	117	124	124	324	685	266	412	361	117	62
20	62	81	117	132	117	266	823	266	361	361	117	62
21	62	71	193	132	104	223	528	266	312	386	110	58
22	62	183	223	117	98	277	412	288	312	336	104	58
23	53	104	558	110	98	277	361	300	312	336	104	53
24	53	200	752	104	98	288	412	386	374	312	98	53
25	53	310	528	98	98	223	336	412	528	266	98	53
26	53	440	468	98	132	203	288	361	498	223	92	53
27	53	244	412	98	156	183	288	312	440	203	81	53
28	53	288	288	92	156	165	244	324	412	183	132	53
29	71	950	244	92	92	165	244	361	386	165	110	53
30	71	500	203	86	....	148	266	312	498	183	98	53
31	71	....	183	71	....	132	....	288	....	183	92	....
1908-9.												
1	66	203	104	86	104	110	156	174	718	374	117	62
2	62	165	92	92	98	98	148	223	860	312	110	62
3	53	193	92	110	110	98	132	324	718	348	104	62
4	53	148	86	183	104	104	117	468	620	312	117	62
5	53	71	81	148	104	98	117	361	558	300	110	62
6	53	98	76	117	104	98	110	288	498	312	92	62
7	53	86	76	117	98	98	98	223	454	288	104	58
8	117	148	81	104	92	98	98	223	426	255	92	58
9	117	76	76	104	92	92	98	234	454	277	92	58
10	117	71	71	98	86	86	104	223	498	266	92	62

Daily discharge, in second-feet, of Clear Fork of Cowlitz River near Lewis, Wash., for the years ending Sept. 30, 1908–1911—Continued.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1908–9—Con.												
11	117	66	71	92	81	81	104	203	558	336	86	62
12	117	62	92	81	81	81	110	203	558	255	86	53
13	76	62	104	81	81	81	117	203	498	213	81	53
14	92	104	92	76	76	86	124	193	440	203	81	53
15	98	58	81	76	86	92	124	193	558	223	81	49
16	76	71	76	104	156	92	117	213	498	223	76	49
17	71	183	71	165	244	98	117	213	468	183	71	53
18	66	558	62	223	223	98	117	223	440	165	76	49
19	71	288	62	468	203	98	110	244	440	156	81	49
20	62	288	62	718	165	92	117	244	412	156	81	71
21	62	266	62	636	148	86	104	223	386	165	71	110
22	53	255	62	652	124	86	104	223	348	174	71	76
23	53	183	66	277	117	86	117	223	361	183	66	71
24	58	183	66	223	124	86	117	266	348	165	62	62
25	58	148	81	193	117	86	117	324	348	165	62	71
26	62	124	124	165	110	92	244	412	348	148	92	62
27	62	117	140	148	117	104	234	386	336	132	71	62
28	66	110	165	124	81	104	223	498	336	132	62	58
29	104	110	132	117	....	117	203	412	266	132	62	66
30	156	117	104	117	....	110	174	386	288	140	62	66
31	336	....	98	110	....	124	....	468	....	124	62	....
1909–10.												
1	62	71	804	153	276	650	263	408	680	276	135	77
2	58	1,350	612	135	239	1,060	251	380	500	276	126	77
3	53	1,480	484	118	228	980	239	394	423	263	126	77
4	49	620	394	110	205	550	228	423	394	263	126	77
5	92	412	339	110	194	420	228	438	438	263	118	77
6	104	288	313	110	194	370	251	453	408	263	135	77
7	76	223	288	103	173	290	251	646	366	263	118	77
8	62	223	276	103	153	310	263	714	339	276	118	77
9	98	183	263	96	153	310	276	732	339	263	118	72
10	86	183	239	96	135	290	276	1,020	394	276	118	72
11	71	148	239	89	135	340	313	940	750	276	103	72
12	62	132	484	89	135	390	366	768	515	263	103	72
13	62	124	484	89	153	480	366	646	408	276	103	72
14	62	104	394	89	135	612	326	579	408	216	103	72
15	53	92	339	83	118	547	300	515	394	228	96	72
16	53	92	313	83	110	579	300	484	408	216	96	72
17	49	92	276	83	103	612	313	515	366	194	89	77
18	49	718	263	96	96	680	339	579	339	184	103	77
19	49	1,270	239	96	96	822	423	547	394	184	103	72
20	53	589	228	89	89	680	663	484	366	184	96	77
21	62	183	216	103	89	714	563	453	313	184	96	77
22	58	752	194	339	118	680	531	453	288	184	89	77
23	49	2,530	184	547	126	629	596	663	276	153	89	77
24	71	1,480	173	680	184	596	860	768	288	135	77	77
25	62	920	173	484	276	547	940	714	313	135	77	72
26	53	646	163	366	263	394	980	646	339	153	77	66
27	49	531	163	288	300	366	732	579	313	135	77	66
28	49	612	153	288	263	313	629	484	288	135	77	66
29	53	2,060	153	276	....	288	500	515	276	144	77	83
30	49	1,310	184	263	....	276	453	579	276	135	77	77
31	53	....	153	313	....	263	....	612	....	135	77	....
1910–11.												
1	110	144	263	153	110	61	239	288	786	326	126	77
2	83	135	313	144	103	61	239	339	714	326	126	77
3	822	153	326	144	96	66	216	366	579	352	126	77
4	563	135	339	135	96	72	194	423	515	366	118	77
5	366	126	313	144	96	72	173	438	394	339	118	96
6	339	163	263	163	96	72	153	394	423	339	118	83
7	339	366	313	228	89	77	144	339	453	352	118	89
8	276	366	288	216	89	77	153	339	453	276	110	77
9	276	288	239	205	89	77	153	326	453	239	103	106
10	184	614	116	173	89	77	153	288	547	251	103	135
11	173	940	216	163	89	77	153	276	714	251	103	126
12	153	612	216	153	83	72	135	300	822	263	103	118
13	135	453	194	126	83	72	135	300	804	263	103	104
14	135	366	194	118	83	72	126	276	714	288	96	89
15	126	326	194	118	77	83	135	288	1,040	288	89	110

Daily discharge, in second-feet, of Clear Fork of Cowlitz River near Lewis, Wash., for the years ending Sept. 30, 1908–1911—Continued.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1910-11—Con.												
16	126	288	173	118	72	96	144	394	612	313	89	228
17	438	239	163	126	77	194	126	394	579	263	89	196
18	300	216	163	126	77	118	153	423	547	251	89	163
19	263	205	153	135	77	126	135	308	453	228	89	149
20	184	352	153	126	77	153	135	366	408	194	89	135
21	153	850	153	118	77	194	153	366	408	194	89	130
22	153	1,350	144	110	72	216	173	438	484	173	89	126
23	135	680	194	103	66	288	194	380	394	173	89	114
24	216	515	228	103	66	263	251	352	326	173	83	103
25	547	408	216	103	72	239	394	313	313	184	83	96
26	339	339	194	96	72	216	339	300	339	163	77	89
27	216	313	194	96	66	184	313	288	484	144	77	86
28	194	263	173	96	66	153	263	300	408	144	77	83
29	173	263	163	89	....	144	271	352	352	135	72	80
30	153	263	173	96	....	144	280	468	326	135	72	77
31	144	....	153	96	....	173	....	646	....	135	77	....

NOTE.—Discharge Aug. 20, 1907, to Nov. 23, 1909, determined from a poorly defined rating curve. Discharge Nov. 24, 1909, to Sept. 30, 1911, determined from a rating curve fairly well defined between 60 and 800 second-feet. Discharge for Nov. 24, 25, 26, 29, and 30, and Dec. 1, 1907, for Mar. 1 to 13, and Nov. 22, 1910, and for Sept. 15, 1911, estimated by comparison with records of adjacent stations. Discharge interpolated for all other days when no gage height was reported.

Monthly discharge of Clear Fork of Cowlitz River near Lewis, Wash., for 1907–1911.

[Drainage area, 48 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
1907.							
August 20-31	....	....	93.2	1.94	0.87	2,220	C.
September	165	71	89.1	1.86	2.08	5,300	C.
The period	....	....	....	....	....	7,520	
1907-8.							
October	71	53	63.5	1.32	1.52	3,900	C.
November	950	62	156	3.25	3.63	9,280	C.
December	752	117	258	5.38	6.20	15,900	C.
January	183	71	130	2.71	3.12	7,990	C.
February	156	71	97.2	2.02	2.18	5,590	C.
March	1,480	86	291	6.06	6.99	17,900	C.
April	823	104	265	5.52	6.16	15,800	C.
May	468	203	304	6.33	7.30	18,700	C.
June	752	266	461	9.60	10.71	27,400	C.
July	652	165	394	8.21	9.46	24,200	C.
August	183	81	125	2.60	3.00	7,690	C.
September	81	53	66.1	1.38	1.54	3,930	C.
The year	1,480	53	218	4.54	61.81	158,000	
1908-9.							
October	336	53	85.8	1.79	2.06	5,280	C.
November	558	62	157	3.27	3.65	9,340	C.
December	165	62	87.4	1.82	2.10	5,370	C.
January	718	76	194	4.04	4.66	11,900	C.
February	244	76	119	2.48	2.58	6,610	C.
March	124	81	95.5	1.99	2.29	5,870	C.
April	244	98	132	2.75	3.07	7,860	C.
May	498	174	280	5.83	6.72	17,200	C.
June	860	266	468	9.75	10.88	27,800	C.
July	374	124	220	4.58	5.28	13,500	C.
August	117	62	83.0	1.73	1.99	5,100	C.
September	110	49	61.8	1.29	1.44	3,680	C.
The year	860	49	165	3.44	46.72	120,000	

Monthly discharge of Clear Fork of Cowlitz River near Lewis, Wash., for 1907-1911—Continued.

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
1909-10.							
October	104	49	61.6	1.28	1.48	3,790	C.
November	2,530	71	647	13.5	15.06	38,500	C.
December	804	153	296	6.17	7.11	18,200	C.
January	680	83	192	4.00	4.61	11,800	C.
February	300	89	169	3.52	3.66	9,390	C.
March	1,060	263	517	10.8	12.45	31,800	C.
April	980	228	434	9.04	10.09	25,800	C.
May	1,020	380	585	12.2	14.07	36,000	C.
June	680	276	387	8.06	8.99	23,000	C.
July	276	135	211	4.40	5.07	13,000	C.
August	135	77	101	2.10	2.42	6,210	C.
September	77	66	74.4	1.55	1.73	4,430	C.
The year	2,530	49	307	6.40	86.74	222,000	
1910-11.							
October	822	83	252	5.25	6.05	15,500	C.
November	1,350	135	391	8.15	9.09	23,300	B.
December	326	144	215	4.48	5.16	13,200	B.
January	228	96	133	2.77	3.19	8,180	B.
February	110	66	82.3	1.71	1.78	4,570	B.
March	288	61	129	2.69	3.10	7,930	B.
April	394	126	194	4.04	4.51	11,500	B.
May	646	276	360	7.50	8.65	22,100	B.
June	1,040	313	528	11.0	12.27	31,400	B.
July	366	135	242	5.04	5.81	14,900	B.
August	126	72	96.4	2.01	2.32	5,930	A.
September	228	77	110	2.29	2.56	6,540	A.
The year	1,350	61	228	4.75	64.49	165,000	

COAL CREEK NEAR LEWIS, WASH.

Location.—In sec. 6, T. 13 N., R. 10 E., at the crossing of the Yakima Valley trail, half a mile above the mouth, and about 4 miles northeast of Lewis.

Records available.—November 5, 1910, to September 30, 1911.

Gage.—Vertical staff.

Channel.—Rocky; practically permanent.

Discharge measurements.—Made from the trail bridge or by wading near the gage.

Accuracy.—Results fair.

Cooperation.—Field data furnished by the Valley Development Co.

Discharge measurements of Coal Creek near Lewis, Wash., in 1910-11.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Nov. 5		1.00	23.0	June 1		2.30	179
5		1.00	20.0	29		1.50	81.0
				Oct. 6	G. L. Parker	.80	9.2
1911.							
May 26		1.50	65.0				

NOTE.—Discharge measurements of Nov. 5, 1910, May 26, and June 1 and 29, 1911, made by employees of the Valley Development Co.

Daily gage height, in feet, of Coal Creek near Lewis, Wash., for the year ending Sept. 30, 1911.

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	1.4	1.2	1.05	0.75	1.65	1.5	2.3	1.5	0.8	0.55
2	....	1.8	1.15	1.0	.75	1.65	1.65	2.2	1.5	.8	.6
3	....	1.8	1.15	1.0	.75	1.55	1.7	2.2	1.55	.8	.6
4	....	1.8	1.2	1.0	.85	1.45	1.75	1.8	1.65	.8	.6
5	....	1.7	1.2	.95	.85	1.4	1.8	1.65	1.55	.8	.7
6	1.15	1.6	1.35	.95	.85	1.3	1.7	1.65	1.55	.75	.65
7	2.0	1.7	1.5	.9	.9	1.25	1.6	1.7	1.5	.75	.65
8	2.0	1.6	1.45	.9	.9	1.25	1.6	1.7	1.4	.75	.5
9	1.7	1.5	1.4	.9	.9	1.25	1.55	1.7	1.3	.7	....
10	....	1.4	1.3	.9	.9	1.25	1.45	1.8	1.3	.7	.95
11	2.5	1.4	1.3	.9	.9	1.2	1.4	2.25	1.25	.7	....
12	2.1	1.35	1.25	.85	.85	1.15	1.45	2.3	1.25	.7	.75
13	1.8	1.25	1.15	.85	.85	1.1	1.45	2.2	1.25	.7	....
14	1.7	1.25	1.05	.85	.85	1.1	1.4	2.1	1.25	.7	.8
15	1.5	1.2	1.05	.85	1.0	1.1	1.45	1.95	1.25	.7	....
16	1.4	1.25	1.05	.8	1.15	1.15	1.7	1.9	1.2	.7	1.4
17	1.3	1.2	1.1	.8	.8	1.1	1.7	1.8	1.15	.7	....
18	1.3	1.2	1.1	.8	1.4	1.2	1.8	1.7	1.1	.65	1.35
19	1.25	1.25	1.15	.8	1.4	1.2	1.75	1.65	1.05	.65	....
20	1.8	1.2	1.1	.8	1.55	1.2	1.65	1.55	1.05	.7	1.15
21	....	1.2	1.05	.8	1.65	1.3	1.7	1.6	1.0	.7	....
22	2.4	1.15	1.0	.8	1.7	1.4	1.8	1.65	1.0	.65	1.05
23	2.2	1.4	1.0	.8	1.85	1.4	1.7	1.5	.95	.65	....
24	2.0	1.55	1.0	.8	1.75	1.65	1.65	1.4	.95	.6	.9
25	1.8	1.5	.95	.8	1.6	1.9	1.55	1.35	.9	.6	....
26	1.6	1.4	.95	.8	1.55	1.75	1.5	1.45	.9	.6	.9
27	1.5	1.4	.9	.75	1.65	1.6	1.5	1.65	.9	.6	....
28	1.4	1.3	.9	.75	1.3	1.5	1.55	1.6	.85	.6	.85
29	1.4	1.25	.9	....	1.3	....	1.65	1.5	.85	.55	....
30	1.4	1.3	1.0	....	1.35	....	1.9	1.5	.85	.6	.8
31	....	1.25	1.05	....	1.5	....	2.2	....	.8	.6	....

Daily discharge, in second-feet, of Coal Creek near Lewis, Wash., for the year ending Sept. 30, 1911.

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	59	38	26	7	88	70	180	70	9	1.2
2	....	107	34	22	7	88	88	164	70	9	2
3	....	107	34	22	7	76	94	164	76	9	2
4	....	107	38	22	12	64	100	107	88	9	2
5	....	94	38	18	12	59	107	88	76	9	5
6	34	82	54	18	12	48	94	88	76	7	3.5
7	134	94	70	15	15	43	82	94	70	7	3.5
8	134	82	64	15	15	43	82	94	59	7	.5
9	94	70	59	15	15	43	76	94	48	5	9.2
10	154	59	48	15	15	43	64	107	48	5	18
11	214	59	48	15	15	38	59	172	43	5	12
12	148	54	43	12	12	34	64	150	43	5	7
13	107	43	34	12	12	30	64	164	43	5	8
14	94	43	26	12	12	30	59	148	43	5	9
15	70	38	26	12	22	30	64	127	43	5	34
16	59	43	26	9	34	34	94	120	38	5	59
17	48	38	30	9	9	30	94	107	34	5	56
18	48	38	30	9	59	38	107	94	30	3.5	54
19	43	43	34	9	59	38	100	88	26	3.5	44
20	107	38	30	9	76	38	88	76	26	5	34
21	152	38	26	9	88	48	94	82	22	5	30
22	196	34	22	9	94	59	107	88	22	3.5	26
23	164	59	22	9	114	59	94	70	18	3.5	20
24	134	76	22	9	100	88	88	59	18	2	15
25	107	70	18	9	82	120	76	54	15	2	15
26	82	59	18	9	76	100	70	64	15	2	15
27	70	59	15	7	88	82	70	88	15	2	14
28	59	48	15	7	48	70	76	82	12	2	12
29	59	43	15	....	48	70	88	70	12	1.2	10
30	59	48	22	....	54	70	120	70	12	2	9
31	....	43	26	....	70	....	164	....	9	2	....

NOTE.—Discharge determined from a rating curve well defined between 5 and 400 second-feet. Discharge interpolated for days when no gage height was reported.

Monthly discharge of Coal Creek at mouth, near Lewis, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
November 6-30	214	34	103	5,100	B.
December	107	34	60.5	3,720	B.
January	70	15	33.1	2,040	B.
February	26	7	13.0	722	B.
March	114	7	41.6	2,560	B.
April	120	30	56.7	3,370	B.
May	164	59	87.0	5,350	B.
June	180	54	106	6,310	B.
July	88	9	39.4	2,420	B.
August	9	1.2	4.85	298	B.
September	59	.5	17.7	1,050	B.
The period				32,900	

LAKE CREEK NEAR LEWIS, WASH.

Location.—In sec. 11, T. 13 N., R. 9 E., about one-fourth mile above the mouth, one-fourth mile below the crossing of the Yakima Valley trail, and about 2 miles northeast of Lewis.

Records available.—August 21, 1907, to September 30, 1911.

Drainage area.—26 square miles.

Gage.—Vertical staff.

Channel.—Rocky; practically permanent.

Discharge measurements.—Made from a cable or by wading near the gage.

Accuracy.—Results fair.

Cooperation.—Field data furnished by the Valley Development Co.

Discharge measurements of Lake Creek, near Lewis, Wash., in 1907–1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
1907.				Oct. 19		.80	100
Aug. 16		0.50	89.0	19		.78	98.0
Nov. 22	J. C. Stevens	.40	63.0	19		.75	84.0
25	do	1.00	163				
				1911.			
1910.				May 26		.95	132
Sept. 22		.37	49.0	June 1		1.30	226
22		.37	48.0	13		1.80	393
22		.37	35.0	29		1.20	227
				Oct. 4	G. L. Parker	.32	43.7

NOTE.—Discharge measurements of Aug. 16, 1907, Sept. 22 and Oct. 19, 1910, and May 26, June 1, 13, and 29, 1911, were made by employees of the Valley Development Co.

Daily gage height, in feet, and discharge, in second-feet, of Lake Creek near Lewis, Wash., for the year ending Sept. 30, 1907.

Day.	August.		September.		Day.	August.		September.	
	Gage height.	Discharge.	Gage height.	Discharge.		Gage height.	Discharge.	Gage height.	Discharge.
1	......	......	0.5	74	16	......	......	0.6	87
2	......	......	.5	74	17	......	......	.7	103
3	......	......	.6	87	18	......	......	.6	87
4	......	......	.6	87	19	......	......	.5	74
5	......	......	.6	87	20	......	......	.5	74
6	......	......	.5	74	21	0.4	63	.5	74
7	......	......	.5	74	22	.5	74	.5	74
8	......	......	.5	74	23	.5	74	.4	63
9	......	......	.5	74	24	.5	74	.4	63
10	......	......	.5	74	25	.6	87	.4	63
11	......	......	.5	74	26	.7	103	.4	63
12	......	......	.5	74	27	.6	87	.4	63
13	......	......	.5	74	28	.5	74	.4	63
14	......	......	.4	63	29	.5	74	.4	63
15	......	......	.4	63	30	.5	74	.4	63
					31	.5	74	......	......

Daily gage height, in feet, of Lake Creek near Lewis, Wash., for the years ending Sept. 30, 1908–1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1907–8.												
1	0.4	0.4	1.0	0.8	0.45	0.45	0.8	1.0	0.95	1.6	1.0	0.55
2	.4	.4	1.0	.8	.45	.45	.7	1.1	.95	1.8	1.0	.5
3	.3	.4	.9	.75	.4	.4	.7	1.1	.95	1.8	1.0	.6
4	.3	.4	.8	.7	.4	.4	.7	1.1	.95	1.8	.9	.55
5	.4	.4	.9	.7	.5	.4	.7	1.0	.9	1.7	.9	.55
6	.4	.3	.8	.7	.55	.4	.7	1.1	.8	1.6	.9	.5
7	.3	.3	.8	.7	.5	.35	.65	1.1	.95	1.6	.9	.5
8	.3	.3	.8	.7	.5	.3	.65	1.0	1.1	1.7	.85	.6
9	.3	.3	.8	.7	.45	.3	.6	1.1	1.2	1.8	.85	.5
10	.3	.2	.7	.75	.4	.3	.6	1.1	1.6	1.8	.85	.5
11	.3	.2	.7	.75	.4	.35	.6	1.1	1.8	1.7	.8	.5
12	.3	.2	.8	.7	.4	.5	.65	1.0	1.8	1.7	.8	.55
13	.3	.2	.9	.65	.4	1.0	.7	.9	1.7	1.9	.7	.55
14	.3	.2	.9	.65	.4	1.6	.7	.9	1.7	1.8	.7	.55
15	.3	.2	.8	.65	.45	4.0	.7	.9	1.8	1.7	.7	.55
16	.3	.2	.7	.65	.45	4.0	.7	.9	1.7	1.6	.75	.45
17	.3	.2	.7	.65	.55	1.8	.8	.9	1.6	1.5	.8	.45
18	.2	.2	.6	.65	.55	1.6	1.0	.9	1.5	1.5	.85	.45
19	.2	.2	.6	.65	.55	1.4	1.1	.9	1.8	1.5	.85	.35
20	.2	.3	.6	.7	.5	1.2	1.4	.9	1.4	1.5	.9	.35
21	.2	.3	.7	.7	.45	1.1	1.4	.9	1.2	1.6	.9	.35
22	.2	.4	.9	.75	.45	1.0	1.35	.9	1.2	1.6	.85	.35
23	.2	.4	1.3	.65	.4	1.0	1.3	.9	1.1	1.6	.8	.35
24	.2	.9	1.6	.6	.4	1.0	1.3	.95	1.1	1.5	.75	.3
25	.2	1.0	1.5	.65	.4	.95	1.2	1.0	1.2	1.4	.7	.3
26	.2	1.1	1.5	.55	.45	.9	1.2	1.0	1.4	1.2	.6	.3
27	.2	1.0	1.3	.55	.55	.9	1.2	1.0	1.5	1.1	.6	.3
28	.2	1.0	1.2	.5	.55	.8	1.0	1.0	1.4	1.0	.75	.3
29	.3	1.2	1.0	.5	.5	.8	1.0	1.0	1.4	1.0	.75	.25
30	.4	1.1	.95	.45	......	.8	.95	1.0	1.4	1.0	.65	.25
31	.4	......	.85	.45	......	.8	......	1.0	......	1.0	.6	......
1908–9.												
1	.3	.5	.6	.65	.65	.65	.6	.55	1.5	1.3	.85	.5
2	.35	.8	.55	.65	.65	.65	.6	.65	1.9	1.2	.8	.55
3	.3	.7	.5	.8	.65	.65	.55	.7	1.9	1.25	.8	.55
4	.3	.65	.45	.9	.65	.6	.55	.8	1.75	1.25	.8	.55
5	.3	.6	.45	.8	.65	.55	.55	.9	1.6	1.25	.8	.6
6	.25	.5	.45	.8	.65	.55	.5	.8	1.5	1.2	.75	.6
7	.25	.45	.45	.75	.55	.55	.5	.8	1.5	1.25	.75	.6
8	.25	.4	.5	.7	.55	.55	.5	.8	1.4	1.25	.7	.55
9	.25	.35	.45	.6	.55	.55	.45	.8	1.3	1.2	.7	.55
10	.25	.3	.4	.5	.5	.55	.5	.8	1.35	1.2	.7	.55

Daily gage height, in feet, of Lake Creek near Lewis, Wash., for the years ending Sept. 30, 1908–1911—Continued.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1908-9—Con.												
11	0.25	0.3	0.4	0.5	0.45	0.5	0.45	0.8	1.45	1.25	0.7	0.55
12	.25	.3	.6	.4	.4	.4	.45	.8	1.5	1.25	.7	.5
13	.4	.3	.65	.4	.4	.4	.45	.75	1.5	1.2	.7	.45
14	.65	.3	.65	.35	.4	.45	.45	.7	1.4	1.2	.65	.4
15	.65	.25	.55	.35	.5	.5	.5	.7	1.5	1.15	.65	.4
16	.55	.3	.45	.4	.7	.5	.5	.7	1.5	1.1	.65	.35
17	.5	.4	.45	.75	.9	.55	.45	.7	1.45	1.1	.65	.35
18	.45	.9	.45	.95	.95	.55	.45	.7	1.45	1.0	.65	.3
19	.45	.8	.45	1.1	.9	.5	.45	.7	1.4	.95	.65	.3
20	.45	.9	.4	1.5	.85	.45	.45	.7	1.4	.9	.65	.6
21	.6	.8	.4	1.5	.75	.45	.45	.7	1.35	.9	.65	.65
22	.4	.8	.4	1.3	.7	.45	.4	.7	1.4	.85	.65	.65
23	.5	.7	.45	1.15	.7	.45	.4	.7	1.3	1.0	.6	.6
24	.3	.7	.45	1.0	.7	.4	.4	.7	1.3	1.0	.6	.55
25	.3	.65	.6	.95	.65	.45	.5	.7	1.3	1.0	.6	.5
26	.4	.6	.75	.9	.65	.45	.65	.8	1.3	.95	.65	.5
27	.4	.55	.85	.8	.65	.45	.65	1.0	1.15	.9	.65	.45
28	.4	.5	1.0	.75	.5	.5	.65	1.1	1.3	.85	.6	.45
29	.3	.5	.9	.7	......	.55	.65	1.15	1.3	.85	.6	.5
30	.5	.6	.8	.7	......	.5	.6	1.1	1.3	.85	.55	.5
31	.8	......	.7	.65	......	.55	......	1.2	......	.85	.55	......
1909-10.												
1	.5	.4	1.9	.65	.85	1.8	.85	1.2	1.4	.8	.65	.45
2	.4	1.1	1.65	.6	.8	2.6	.85	1.1	1.3	.85	.65	.4
3	.4	2.0	1.6	.6	.7	1.85	.85	1.1	1.3	.8	.6	.4
4	.35	1.9	1.3	.55	.7	1.75	.8	1.1	1.25	.7	.6	.4
5	.35	1.6	1.1	.55	.7	1.4	.8	1.1	1.15	.8	.6	.4
6	.5	1.3	1.0	.55	.65	1.3	.8	1.1	1.15	.85	.6	.4
7	.45	1.1	1.0	.5	.65	1.15	.8	1.2	1.1	.85	.7	.4
8	.45	1.1	1.0	.5	.6	1.0	.85	1.4	1.1	.95	.6	.2
9	.55	.9	.9	.4	.5	.9	.85	1.4	1.1	.95	.7	.2
10	.55	.9	.85	.4	.5	.8	.85	1.55	1.0	1.0	.7	.2
11	.55	.8	1.85	.35	.45	.85	.9	1.75	1.25	1.1	.6	.2
12	.5	.7	1.2	.35	.45	1.0	.95	1.7	1.4	1.1	.6	.2
13	.5	.7	1.3	.3	.4	1.0	.95	1.6	1.4	1.1	.6	.2
14	.5	.65	1.2	.3	.4	1.1	.95	1.5	1.25	1.0	.6	.2
15	.45	.5	1.1	.3	.4	1.2	.9	1.4	1.2	1.0	.6	.2
16	.4	.5	1.1	.3	.35	1.6	.9	1.4	1.1	.95	.6	.2
17	.35	.5	1.0	.3	.35	1.45	.85	1.25	1.1	.95	.6	.2
18	.3	.9	.9	.4	.35	1.45	.85	1.25	.95	.85	.45	.2
19	.3	1.8	.85	.4	.35	1.65	1.1	1.3	1.0	.85	.5	.2
20	.35	1.9	.85	.4	.35	1.65	1.25	1.2	1.1	.85	.5	.25
21	.35	1.8	.8	.4	.35	1.65	1.25	1.2	1.0	.85	.5	.3
22	.35	2.0	.8	.6	.25	1.6	1.2	1.2	.95	.85	.5	.35
23	.35	2.8	.75	1.1	.25	1.6	1.25	1.3	.9	.8	.5	.35
24	.4	3.0	.7	1.1	.45	1.4	1.4	1.4	.8	.8	.45	.35
25	.35	2.5	.7	1.1	.7	1.35	1.6	1.5	.8	.8	.4	.3
26	.3	2.0	.65	1.1	.7	1.15	1.7	1.45	.95	.8	.4	.3
27	.3	1.75	.65	.9	1.0	1.1	1.6	1.4	.95	.75	.4	.3
28	.3	1.75	.6	.9	1.0	1.0	1.5	1.35	.9	.75	.4	.3
29	.3	2.1	.55	.9	......	1.0	1.4	1.3	.9	.75	.4	.3
30	.3	2.1	.7	.85	......	.95	1.3	1.3	.8	.7	.45	.3
31	.35	......	.7	.95	......	.95	......	1.35	......	.7	.45	......
1910-11.												
1	.45	.65	1.0	.7	.5	.25	.55	.55	1.35	1.15	.85	.55
2	.5	.65	1.2	.65	.5	.25	.55	.6	1.4	1.1	.85	.45
3	.9	.65	1.2	.65	.5	.25	.5	.65	1.4	1.15	.8	.55
4	1.1	.65	1.1	.65	.5	.25	.5	.65	1.35	1.15	.8	.55
5	1.0	.6	1.0	.6	.45	.25	.5	.75	1.25	1.2	.75	.6
6	.9	.6	1.0	.65	.45	.25	.5	.8	1.15	1.25	.75	.6
7	.95	.75	1.0	.7	.45	.3	.45	.8	1.1	1.3	.75	.6
8	.9	.9	1.1	.7	.45	.3	.45	.85	1.1	1.2	.7	.6
9	.9	.9	1.0	.75	.4	.3	.5	.85	1.1	1.15	.7	......
10	.9	......	1.0	.7	.4	.3	.5	.85	1.1	1.1	.7	.8
11	.8	1.8	1.0	.7	.4	.3	.5	.8	1.35	1.1	.7	......
12	.7	1.6	.9	.7	.4	.3	.5	.85	1.6	1.0	.7	.7
13	.55	1.4	.8	.65	.4	.3	.5	.8	1.8	1.0	.65	......
14	.5	1.25	.8	.6	.4	.3	.4	1.8	1.8	1.1	.65	.6
15	.5	1.1	.8	.6	.4	.3	.4	.8	1.75	1.2	6	......

Daily gage height, in feet, of Lake Creek near Lewis, Wash., for the years ending Sept. 30, 1908–1911—Continued.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1910-11—Con.												
16	0.5	1.0	0.8	0.6	0.35	0.35	0.45	0.8	1.65	1.3	0.6	0.8
17	.6	.85	.8	.6	.35	.35	.45	.85	1.6	1.3	.55	....
18	.8	.9	.7	.65	.35	.4	.5	.95	1.5	1.3	.55	.7
19	.8	.85	.7	.7	.35	.4	.5	1.0	1.4	1.2	.55	....
20	.7	1.05	.65	.7	.35	1.45	.5	1.0	1.35	1.15	.6	.6
21	.65	....	.65	.65	.3	.55	.5	1.0	1.3	1.1	.55	....
22	.6	1.8	.65	.6	.3	.55	.5	.95	1.25	1.0	.55	.55
23	.55	1.8	.7	.6	.3	.55	.6	.95	1.25	.95	.55	....
24	.65	1.5	.8	.6	.3	.6	.6	1.0	1.2	.95	.55	.5
25	1.0	1.4	.75	.55	.3	.55	.65	1.0	1.1	1.0	.55	....
26	1.0	1.3	.7	.5	.3	.55	.6	.95	1.15	1.0	.55	.45
27	.9	1.1	.7	.5	.55	.5	.6	.95	1.25	.95	.55	....
28	.85	1.05	.7	.5	.25	.5	.55	.95	1.3	.95	.55	.45
29	.8	1.0	.7	.5	....	.5	....	.95	1.25	.9	.55	....
30	.75	1.0	.75	.5	....	.5	....	.95	1.2	.9	.55	.35
31	.7	....	.75	.5	....	.5	....	1.1	....	.9	.5	....

Daily discharge, in second-feet, of Lake Creek near Lewis, Wash., for the years ending Sept. 30, 1908–1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1907-8.												
1	63	63	163	121	68	68	102	145	134	324	145	66
2	63	63	163	121	68	68	85	170	134	393	145	60
3	54	63	141	112	63	63	85	170	134	393	145	72
4	54	63	121	103	63	63	85	170	134	393	122	66
5	63	63	141	103	74	63	85	145	122	358	122	66
6	63	54	121	103	80	63	85	170	102	324	122	60
7	54	54	121	103	74	58	78	170	134	324	122	60
8	54	54	121	103	74	54	78	145	170	358	112	72
9	54	54	121	103	68	54	72	170	198	393	112	60
10	54	46	103	112	63	54	72	170	324	393	112	60
11	54	46	103	112	63	58	72	170	393	358	102	60
12	54	46	121	103	63	74	78	145	393	358	102	66
13	54	46	141	95	63	163	85	122	358	428	85	66
14	54	46	141	95	63	325	85	122	358	393	85	66
15	54	46	121	95	68	1,440	85	122	393	358	85	66
16	54	46	103	95	68	1,440	85	122	358	324	94	56
17	54	46	103	95	80	393	102	122	324	290	102	56
18	46	46	87	95	80	324	145	122	290	290	112	56
19	46	46	87	95	80	258	170	122	393	290	112	47
20	46	54	87	103	74	198	258	122	258	290	122	47
21	46	54	103	103	68	170	258	122	198	324	122	47
22	46	63	141	112	68	145	242	122	198	324	112	47
23	46	63	236	95	63	145	227	122	170	324	102	47
24	46	141	325	87	63	145	227	134	170	290	94	43
25	46	163	294	95	63	134	198	145	198	258	85	43
26	46	186	294	80	68	122	198	145	258	198	72	43
27	46	163	236	80	80	122	198	145	290	170	72	43
28	46	163	210	74	80	102	145	145	258	145	94	43
29	54	210	163	74	74	102	145	145	258	145	94	40
30	63	186	152	68	....	102	134	145	258	145	78	40
31	63	....	131	68	....	102	....	145	....	145	72	....
1908-9.												
1	43	60	72	78	78	78	72	66	290	227	112	60
2	47	102	66	78	78	78	72	78	428	198	102	66
3	43	85	60	102	78	78	66	85	428	212	102	66
4	43	78	56	122	78	72	66	102	376	212	102	66
5	43	72	56	102	78	66	66	122	324	212	102	72
6	45	60	56	102	78	66	60	102	290	198	94	72
7	40	56	56	94	66	66	60	102	290	212	94	72
8	40	51	60	85	66	66	60	102	258	212	85	66
9	40	47	56	72	66	66	56	102	227	198	85	66
10	40	43	51	60	60	66	60	102	242	198	85	66

Daily discharge, in second-feet, of Lake Creek near Lewis, Wash., for the years ending Sept. 30, 1908–1911—Continued.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1908-9—Con.												
11	40	43	51	60	56	60	56	102	274	212	85	66
12	40	43	72	51	51	51	56	102	290	212	85	60
13	51	43	78	51	51	51	56	94	290	198	85	56
14	78	43	78	47	51	56	56	85	258	198	78	51
15	78	40	66	47	60	60	60	85	290	184	78	51
16	66	43	56	51	85	60	60	85	290	170	78	47
17	60	51	56	94	122	66	56	85	274	170	78	47
18	56	122	56	134	134	66	56	85	274	145	78	43
19	56	102	56	170	122	60	56	85	258	134	78	43
20	56	122	51	290	112	56	56	85	258	122	78	72
21	72	102	51	290	94	56	56	85	242	122	78	78
22	51	102	51	227	85	56	51	85	258	112	78	78
23	60	85	56	184	85	56	51	85	227	145	72	72
24	43	85	56	145	85	51	51	85	227	145	72	66
25	43	78	72	134	78	56	60	85	227	145	72	60
26	51	72	94	122	78	56	78	102	227	134	78	60
27	51	66	112	102	78	56	78	145	184	122	78	56
28	51	60	145	94	60	60	78	170	227	112	72	56
29	43	60	122	85	......	66	78	184	227	112	72	60
30	60	72	102	85	......	66	72	170	227	112	66	60
31	102	......	85	78	......	66	......	198	......	112	66	......
1909-10.												
1	60	51	428	78	112	393	112	198	258	102	78	56
2	51	170	341	72	102	714	112	170	227	112	78	51
3	51	464	324	72	85	410	112	170	227	102	72	51
4	47	428	227	66	85	376	102	170	212	85	72	51
5	47	324	170	66	85	258	102	170	184	102	72	51
6	60	227	145	66	78	227	102	170	184	112	72	51
7	56	170	145	60	78	184	102	198	170	112	85	51
8	56	170	145	60	72	145	112	258	170	134	72	36
9	66	122	122	51	60	122	112	258	170	134	85	36
10	66	122	112	51	60	102	112	307	145	145	85	36
11	66	102	410	47	56	112	122	376	212	170	72	36
12	60	85	198	47	56	145	134	358	258	170	72	36
13	60	85	227	43	51	145	134	324	258	170	72	36
14	60	78	198	43	51	170	134	290	212	145	72	36
15	56	60	170	43	51	198	122	258	198	145	72	36
16	51	60	170	43	47	324	122	258	170	134	72	36
17	47	60	145	43	47	274	112	212	170	134	72	36
18	43	122	122	51	47	274	112	212	134	112	56	36
19	43	393	112	51	47	341	170	227	145	112	60	36
20	47	428	112	51	47	341	212	198	170	112	60	40
21	47	393	102	51	47	341	212	198	145	112	60	43
22	47	464	102	72	40	324	198	198	134	112	60	47
23	47	808	94	170	40	324	212	227	122	102	60	47
24	51	905	85	170	56	258	258	258	102	102	56	47
25	47	668	85	170	85	242	324	290	102	102	51	43
26	43	464	78	170	85	184	358	274	134	102	51	43
27	43	376	78	122	145	170	324	258	134	94	51	43
28	43	376	72	122	145	145	290	242	122	94	51	43
29	43	502	66	122	......	145	258	227	122	94	51	43
30	43	502	85	112	......	134	227	227	102	85	56	43
31	47	......	85	134	......	134	......	242	......	85	56	......
1910-11.												
1	56	78	145	85	60	40	66	66	242	184	112	66
2	60	78	198	78	60	40	66	72	258	170	112	56
3	122	78	198	78	60	40	60	78	258	184	102	66
4	170	78	170	78	60	40	60	78	242	184	102	66
5	145	72	145	72	56	40	60	94	212	198	94	72
6	122	72	145	78	56	40	60	102	184	212	94	72
7	134	94	145	85	56	43	56	102	170	227	94	72
8	122	122	170	85	56	43	56	112	170	198	85	72
9	122	122	145	94	51	43	60	112	170	184	85	87
10	122	258	145	85	51	43	60	112	170	170	85	102
11	102	393	145	85	51	43	60	102	242	170	85	94
12	85	324	122	85	51	43	60	112	324	145	85	85
13	66	258	102	78	51	43	60	102	393	145	78	78
14	60	212	102	72	51	43	51	393	393	170	78	72
15	60	170	102	72	51	43	51	102	376	198	72	87

Daily discharge, in second-feet, of Lake Creek near Lewis, Wash., for the years ending Sept. 30, 1908–1911—Continued.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1910–11—Con.												
16	60	145	102	72	47	47	56	102	341	227	72	102
17	72	112	102	72	47	47	56	112	324	227	66	94
18	102	122	85	78	47	51	60	134	290	227	66	85
19	102	112	85	85	47	51	60	145	258	198	66	78
20	85	158	78	85	47	274	60	145	141	184	72	72
21	78	280	78	78	43	66	60	145	227	170	66	69
22	72	393	78	72	43	66	60	134	212	145	66	66
23	66	393	85	72	43	66	72	134	212	134	66	62
24	78	290	102	72	43	72	72	145	198	134	66	60
25	145	258	94	66	43	66	78	145	170	145	66	58
26	145	227	85	60	43	66	72	134	184	145	66	56
27	122	170	85	60	66	60	72	134	212	134	66	56
28	112	158	85	60	40	60	66	134	227	134	66	56
29	102	145	85	60	......	60	66	134	212	122	66	52
30	94	145	94	60	......	60	66	134	198	122	66	47
31	85	......	94	60	......	60	......	170	......	122	60	......

NOTE.—Discharge Aug. 21, 1907, to Mar. 16, 1908, determined from a rating curve well defined above 60 second-feet. Discharge Mar. 17, 1908, to Sept. 30, 1911, determined from a rating curve well defined between 40 and 600 second-feet. Discharge interpolated for all days when no gage height was reported.

Monthly discharge of Lake Creek near Lewis, Wash., for 1907–1911.

[Drainage area, 26 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
1907.							
August 21–31	103	63	78.0	3.00	1.23	1,700	B.
September	103	63	73.5	2.83	3.16	4,370	B.
The period	....	....	....	....	....	6,070	
1907–8.							
October	63	46	52.9	2.03	2.34	3,250	B.
November	210	46	81.2	3.12	3.48	4,830	B.
December	325	87	151	5.81	6.70	9,280	B.
January	121	68	96.9	3.73	4.30	5,960	B.
February	80	63	69.8	2.68	2.89	4,010	B.
March	1,440	54	215	8.27	9.53	13,200	B.
April	258	72	132	5.08	5.67	7,860	B.
May	170	122	143	5.50	6.34	8,790	B.
June	393	102	245	9.42	10.51	14,600	B.
July	428	145	306	11.8	13.60	18,800	B.
August	145	72	105	4.04	4.66	6,460	C.
September	72	40	55.5	2.13	2.38	3,300	C.
The year	1,440	40	138	5.31	72.40	100,000	
1908–9.							
October	102	40	52.5	2.02	2.33	3,230	C.
November	122	40	69.6	2.68	2.99	4,140	C.
December	145	51	69.5	2.67	3.08	4,270	C.
January	290	47	111	4.27	4.92	6,820	B.
February	134	51	79.0	3.04	3.17	4,390	C.
March	78	51	62.4	2.40	2.77	3,840	C.
April	78	51	62.0	2.38	2.66	3,690	C.
May	198	66	105	4.04	4.66	6,460	C.
June	428	184	273	10.5	11.71	16,200	B.
July	227	112	168	6.46	7.45	10,300	B.
August	112	66	82.8	3.18	3.67	5,090	C.
September	78	43	61.8	2.38	2.66	3,680	C.
The year	428	40	99.6	3.83	52.07	72,100	

Monthly discharge of Lake Creek near Lewis, Wash., for 1907-1911—Continued.

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
1909-10.							
October	66	43	51.8	1.99	2.29	3,190	C.
November	905	51	306	11.8	13.17	18,200	B.
December	428	66	160	6.15	7.09	9,840	B.
January	170	43	81.3	3.13	3.61	5,000	C.
February	145	40	70.0	2.69	2.80	3,890	C.
March	714	102	247	9.50	10.95	15,200	B.
April	358	102	170	6.54	7.30	10,100	B.
May	376	170	239	9.19	10.60	14,700	B.
June	258	102	170	6.54	7.30	10,100	B.
July	170	85	117	4.50	5.19	7,190	B.
August	85	51	66.3	2.55	2.94	4,080	B.
September	56	36	42.5	1.63	1.82	2,530	B.
The year	905	43	144	5.54	75.06	104,000	
1910-11.							
October	170	56	99.0	3.81	4.39	6,090	B.
November	393	72	184	7.08	7.90	10,900	B.
December	198	78	116	4.46	5.14	7,130	B.
January	94	60	74.9	2.88	3.32	4,610	B.
February	66	40	50.7	1.95	2.03	2,820	B.
March	274	40	58.0	2.23	2.57	3,570	B.
April	78	51	62.1	2.39	2.67	3,700	B.
May	393	66	126	4.85	5.59	7,750	A.
June	393	141	240	9.23	10.30	14,300	A.
July	227	122	171	6.58	7.59	10,500	A.
August	112	60	78.2	3.01	3.47	4,810	A.
September	102	47	72.0	2.77	3.09	4,280	A.
The year	393	40	111	4.27	58.06	80,500	

JOHNSON CREEK NEAR LEWIS, WASH.

Location.—In sec. 33, T. 13 N., R. 9 E., about a mile above the mouth and about 3 miles south of Lewis.

Records available.—August 14, 1907, to September 30, 1911.

Drainage area.—Thirty square miles.

Gage.—Vertical staff.

Channel.—Rocks and gravel; shifting in floods.

Discharge measurements.—Made from a cable or by wading near the gage.

Accuracy.—Results fair.

Cooperation.—Field data furnished by the Valley Development Co.

Discharge measurements of Johnson Creek near Lewis, Wash., in 1907-1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1907.		*Feet.*	*Sec.-ft.*	1910.		*Feet.*	*Sec.-ft.*
Aug. 14		0.50	68	Oct. 13		0.60	68
Nov. 24	F. R. Chambers	.95	159	14		.60	72
1910.				1911.			
Sept. 20		.30	38	May 25		1.20	286
20		.30	36	June 1		1.80	688
20		.30	37	14		1.70	605
Oct. 13		.60	86	Oct. 5	G. L. Parker	.49	50

NOTE.—Discharge measurements of Aug. 14, 1907, Sept. 20 and Oct. 13, 14, 1910, and of May 25, and June 1 and 14, 1911, made by employees of the Valley Development Co.

Daily gage height, in feet, and discharge, in second-feet, of Johnson Creek near Lewis, Wash., for the year ending Sept. 30, 1907.

Day.	August.		September.		Day.	August.		September.	
	Gage height.	Discharge.	Gage height.	Discharge.		Gage height.	Discharge.	Gage height.	Discharge.
1	......	......	0.5	63	16	......	......	0.6	80
2	......	......	.5	63	17	......	......	.5	63
3	......	......	.5	63	18	......	......	.5	63
4	......	......	.5	63	19	......	......	.5	63
5	......	......	.5	63	20	......	......	.5	63
6	......	......	.5	63	21	0.5	63	.5	63
7	......	......	.4	48	22	.45	56	.5	63
8	......	......	.4	48	23	.5	63	.4	48
9	......	......	.4	48	24	.5	63	.4	48
10	......	......	.4	48	25	.5	63	.4	48
11	......	......	.4	48	26	.5	63	.4	48
12	......	......	.4	48	27	.5	63	.4	48
13	......	......	.4	48	28	.5	63	.4	48
14	......	......	.4	48	29	.5	63	.4	48
15	......	......	.5	63	30	.5	63	.4	48
					31	.5	63	......	......

Daily gage height, in feet, of Johnson Creek near Lewis, Wash., for the years ending Sept. 30, 1908–1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1907–8.												
1	0.4	0.4	1.0	0.95	0.7	0.7	0.85	1.4	1.2	1.6	0.9	0.5
2	.4	.4	1.0	.9	.65	.65	.85	1.4	1.2	1.6	.85	.45
3	.4	.4	.9	.95	.65	.65	.9	1.3	1.15	1.6	.8	.5
4	.4	.4	1.0	.9	.65	.65	.85	1.25	1.1	1.5	.8	.5
5	.4	.4	1.0	.95	.8	.65	.85	1.2	1.1	1.4	.8	.5
6	.4	.4	.9	.95	.8	.65	.85	1.3	1.2	1.3	.8	.5
7	.4	.4	.9	.9	.75	.6	.8	1.5	1.4	1.5	.8	.5
8	.4	.4	.9	.9	.7	.6	.8	1.4	1.7	1.5	.75	.5
9	.4	.4	.9	.9	.7	.6	.8	1.3	1.8	1.5	.75	.45
10	.4	.4	.9	.9	.7	.6	.8	1.1	1.8	1.5	.75	.45
11	.4	.3	.9	.9	.7	.65	.85	1.1	1.8	1.4	.7	.45
12	.4	.3	1.0	.9	.65	.75	1.0	1.1	1.7	1.4	.7	.45
13	.4	.3	1.2	.85	.65	1.8	1.0	1.1	1.6	1.5	.7	.45
14	.4	.3	1.1	.8	.65	1.8	1.0	1.1	1.7	1.4	.7	.45
15	.4	.3	1.0	.8	.7	2.7	1.1	1.1	1.7	1.3	.7	.50
16	.4	.4	.9	.8	.75	2.1	1.1	1.1	1.6	1.2	.65	.45
17	.4	.4	.85	.8	.8	1.5	1.2	1.1	1.6	1.2	.55	.45
18	.4	.3	.8	.8	.8	1.45	1.6	1.1	1.5	1.2	.5	.45
19	.4	.4	.8	.8	.75	1.3	1.8	1.1	1.4	1.2	.5	.45
20	.3	.4	.85	.9	.7	1.2	1.7	1.1	1.35	1.2	.6	.4
21	.3	.4	.95	.9	.7	1.2	1.5	1.15	1.3	1.2	.6	.4
22	.3	.6	1.5	.85	.7	1.1	1.4	1.15	1.3	1.2	.6	.4
23	.3	.5	1.6	.8	.7	1.1	1.3	1.2	1.25	1.2	.55	.4
24	.3	1.0	1.7	.8	.7	1.1	1.4	1.3	1.3	1.1	.55	.4
25	.3	1.1	1.4	.8	.7	1.0	1.3	1.4	1.45	1.0	.5	.4
26	.3	1.2	1.5	.75	.75	1.0	1.2	1.3	1.5	1.0	.45	.4
27	.3	.9	1.4	.75	.75	1.0	1.2	1.25	1.4	.95	.55	.4
28	.3	1.0	1.3	.7	.75	.95	1.2	1.25	1.3	.9	.65	.4
29	.4	1.2	1.1	.7	.7	.95	1.2	1.25	1.4	.9	.65	.4
30	.4	1.1	1.0	.65	......	.9	1.2	1.25	1.55	.9	.6	.4
31	.4	......	1.0	.6	......	.9	......	1.2	......	.9	.55	......
1908–9.												
1	.4	.5	.7	.7	.65	.8	.85	.9	1.85	.9	.75	.45
2	.4	.8	.7	.7	.65	.8	.85	1.1	1.9	1.15	.7	.45
3	.4	.3	.65	.95	.75	.8	.8	1.2	1.9	1.2	.7	.45
4	.4	.8	.65	1.0	.75	.8	.8	1.25	1.65	1.15	.7	.45
5	.4	.7	.6	.9	.8	.8	.8	1.3	1.55	1.1	.65	.45
6	.35	.6	.6	.9	.8	.75	.75	1.25	1.5	1.1	.65	.45
7	.35	.6	.55	.7	.8	.75	.75	.9	1.5	1.1	.65	.45
8	.35	.55	.6	.65	.75	.75	.75	.85	1.45	1.05	.55	.4
9	.35	.45	.55	.65	.75	.75	.75	.85	1.35	1.05	.55	.4
10	.35	.45	.55	.65	.75	.75	.8	.85	1.4	1.05	.55	.4

Daily gage height, in feet, of Johnson Creek near Lewis, Wash., for the years ending Sept. 30, 1908–1911—Continued.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1908-9—Con.												
11	0.35	0.45	0.55	0.65	0.7	0.7	0.75	1.0	1.6	1.05	0.55	0.4
12	.35	.45	.7	.6	.7	.7	.8	1.0	1.65	1.05	.55	.4
13	.4	.45	.7	.55	.7	.7	.8	.95	1.5	1.0	.55	.4
14	.7	.45	.65	.5	.7	.7	.8	.95	1.5	1.0	.55	.4
15	.6	.45	.55	.65	.7	.75	.8	1.0	1.6	1.0	.55	.4
16	.5	.45	.6	.8	.85	.75	.75	1.0	1.5	1.0	.55	.35
17	.5	.6	.55	1.1	1.1	.8	.75	1.05	1.5	.9	.55	.85
18	.45	.9	.5	1.3	1.1	.8	.75	1.05	1.4	.9	.55	.35
19	.5	.8	.5	1.6	1.0	.8	.75	1.05	1.4	.9	.5	.85
20	.7	.9	.5	1.8	.95	.75	.75	1.05	1.4	.9	.5	.65
21	.65	.9	.5	1.7	.9	.75	.75	1.05	1.45	.9	.5	.55
22	.6	.95	.5	1.45	.35	.75	.75	1.05	1.4	.85	.5	.6
23	.55	.95	.55	1.25	.85	.7	.7	1.1	1.3	.85	.5	.5
24	.55	.8	.5	1.15	.35	.7	.75	1.1	1.3	.85	.5	.45
25	.55	.8	.6	1.1	.85	.7	.8	1.2	1.3	.85	.5	.45
26	.5	.75	.75	1.0	.8	.8	1.0	1.25	1.2	.8	.55	.4
27	.5	.7	.85	.8	.8	.8	1.0	1.45	1.2	.8	.5	.4
28	.5	.7	1.0	.7	.8	.85	1.0	1.5	1.2	.8	.5	.4
29	.5	.7	.9	.7	......	.85	.95	1.3	.9	.75	.5	.45
30	.8	.7	.8	.65	......	.85	.9	1.3	.9	.75	.5	.45
31	.8	......	.7	.65	......	.85	......	1.4	......	.75	.5	......
1909-10.												
1	.45	.5	1.8	.8	1.1	2.0	1.1	1.35	1.4	.85	.5	.4
2	.4	1.3	1.7	.8	1.0	2.5	1.1	1.3	1.3	.9	.5	.45
3	.4	2.1	1.6	.75	.95	1.9	1.1	1.3	1.3	.8	.45	.45
4	.4	1.5	1.3	.75	.85	1.8	1.0	1.4	1.25	.8	.45	.45
5	.4	1.3	1.3	.7	.85	1.5	1.0	1.4	1.15	.8	.45	.45
6	.5	1.2	1.2	.7	.8	1.4	1.0	1.4	1.15	.9	.45	.45
7	.45	1.1	1.0	.7	.7	1.3	1.1	1.6	1.15	.9	.45	.4
8	.45	1.1	1.0	.7	.65	1.2	1.1	1.7	1.1	.95	.5	.3
9	.5	1.0	1.0	.65	.6	1.2	1.1	1.65	1.1	.95	.5	.35
10	.5	1.0	1.0	.65	.6	1.1	1.1	1.8	1.0	1.0	.5	.35
11	.5	.9	1.0	.65	.6	1.25	1.2	1.65	1.5	1.0	.45	.35
12	.5	.9	1.6	.65	.6	1.3	1.3	1.6	1.4	.85	.45	.35
13	.5	.85	1.5	.65	.6	1.6	1.3	1.6	1.4	.8	.45	.3
14	.5	.75	1.4	.6	.6	1.65	1.25	1.5	1.25	.75	.45	.3
15	.45	.75	1.3	.6	.6	1.6	1.2	1.4	1.2	.8	.4	.3
16	.45	.75	1.2	.6	.55	1.7	1.2	1.4	1.1	.8	.4	.3
17	.4	.75	1.1	.6	.55	1.8	1.2	1.4	1.1	.8	.4	.3
18	.35	1.4	1.0	.6	.55	1.8	1.35	1.35	1.0	.75	.45	.3
19	.3	2.2	.95	.6	.5	1.9	1.55	1.3	1.1	.75	.45	.3
20	.35	1.65	.95	.6	.5	1.9	1.6	1.3	1.1	.75	.45	.3
21	.5	1.6	.9	.65	.5	1.9	1.6	1.3	1.0	.75	.5	.3
22	.45	3.0	.8	.75	.5	1.8	1.5	1.3	1.0	.75	.45	.3
23	.45	2.6	.75	1.5	.5	1.8	1.55	1.4	1.0	.75	.5	.25
24	.45	2.6	.75	1.4	.7	1.65	1.7	1.4	.9	.7	.4	.25
25	.45	2.1	.75	1.3	.75	1.5	1.95	1.5	.9	.65	.4	.25
26	.4	1.8	.7	1.25	.65	1.4	1.9	1.45	1.0	.65	.4	.25
27	.4	1.8	.7	1.1	1.1	1.3	1.7	1.4	1.0	.6	.4	.25
28	.4	1.8	.65	1.1	1.1	1.3	1.6	1.3	.95	.6	.4	.3
29	.4	2.1	.6	1.1	......	1.25	1.5	1.3	.9	.55	.4	.3
30	.4	1.8	.8	1.1	......	1.2	1.4	1.35	.85	.55	.4	.3
31	.5	......	.8	1.1	......	1.15	......	1.35	......	.5	.4	......
1910-11.												
1	.5	.65	1.0	.8	.75	.55	1.1	1.1	1.8	1.1	.65	.55
2	.5	.65	1.3	.8	.7	.55	1.1	1.15	1.7	1.1	.65	.5
3	1.2	.7	1.4	.8	.7	.55	1.1	1.2	1.6	1.15	.6	.5
4	1.1	.65	1.4	.8	.7	.55	1.0	1.35	1.45	1.2	.6	.45
5	.9	1.0	1.3	.8	.7	.55	.95	1.4	1.35	1.1	.6	.5
6	.9	.6	1.3	.85	.65	.55	.9	1.4	1.35	1.2	.55	.5
7	.95	1.1	1.4	.95	.65	.6	.9	1.3	1.4	1.1	.6	.5
8	.9	1.1	1.2	.95	.65	.6	.9	1.2	1.35	1.05	.6	.5
9	.9	1.05	1.1	.9	.6	.6	.9	1.2	1.4	1.0	.6	.6
10	.85	2.2	1.0	.9	.6	.6	.9	1.1	1.5	1.0	.6	......
11	.8	2.0	1.1	.85	.6	.6	.9	1.0	1.7	.95	.6	.5
12	.75	1.8	1.05	.85	.6	.6	.85	1.2	1.85	.95	.6	......
13	.6	1.3	1.0	.8	.6	.6	.8	1.2	1.8	.95	.6	.45
14	.6	1.15	1.0	.75	.6	.6	.8	1.1	1.7	1.0	.55	......
15	.6	1.05	1.0	.75	.6	.65	.8	1.1	1.6	1.0	.55	.5

Daily gage height, in feet, of Johnson Creek near Lewis, Wash., for the years ending Sept. 30, 1908–1911—Continued.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1910–11—Con.												
16	0.6	1.0	0.9	0.75	0.55	0.7	0.8	1.2	1.5	1.05	0.55	......
17	.8	1.0	.85	.8	.6	.75	.8	1.2	1.5	.95	.55	0.7
18	.8	.95	.75	.9	.6	.85	.85	1.3	1.4	.95	.55	......
19	.8	.9	.75	.9	.6	.85	.85	1.35	1.35	.9	.55	.6
20	.75	1.25	.75	.9	.6	1.0	.85	1.3	1.3	.9	.55	......
21	.65	2.0	.75	.85	.6	1.1	.8	1.3	1.3	.85	.55	.6
22	.6	1.9	.6	.8	.6	1.1	.95	1.35	1.35	.8	.55	......
23	.6	1.7	.8	.8	.6	1.2	1.0	1.3	1.35	.75	.55	.55
24	.7	1.4	.8	.8	.6	1.2	1.0	1.3	1.2	.85	.55	......
25	.9	1.4	.95	.75	.6	1.1	1.3	1.2	1.15	.8	.5	.5
26	.9	1.3	.95	.75	.6	1.0	1.25	1.2	1.35	.75	.5	......
27	.85	1.2	.9	.75	.6	.9	1.2	1.2	1.3	.7	.5	.5
28	.8	1.1	.9	.75	.55	.9	1.1	1.2	1.2	.7	.5	......
29	.7	1.1	.85	.7	......	.9	......	1.3	1.2	.7	.5	.5
30	.7	1.1	.9	.7	......	.9	......	1.4	1.15	.7	.5	......
31	.65	......	.9	.75	......	1.0	......	1.65	......	.65	.5	......

Daily discharge, in second-feet, of Johnson Creek near Lewis, Wash., for the years ending Sept. 30, 1908–1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1907–8												
1	48	48	189	172	100	100	139	398	283	535	154	63
2	48	48	189	154	90	90	139	398	283	535	139	56
3	48	48	154	172	90	90	154	339	258	535	124	63
4	48	48	189	154	90	90	139	311	232	465	124	63
5	48	48	189	172	124	90	139	283	232	398	124	63
6	48	48	154	172	124	90	139	339	283	339	124	63
7	48	48	154	154	112	80	124	465	398	465	124	63
8	48	48	154	154	100	80	124	398	610	465	112	63
9	48	48	154	154	100	80	124	339	690	465	112	56
10	48	48	154	154	100	80	124	232	690	465	112	56
11	48	37	154	154	100	90	139	232	690	398	100	56
12	48	37	189	154	90	112	189	232	610	398	100	56
13	48	37	283	139	90	690	189	232	535	465	100	56
14	48	37	232	124	90	690	189	232	610	398	100	56
15	48	37	189	124	100	1,510	232	232	610	339	100	63
16	48	48	154	124	112	940	232	232	535	283	90	56
17	48	48	139	124	124	465	283	232	535	283	72	56
18	48	37	124	124	124	432	535	232	465	283	63	56
19	48	48	124	124	112	339	690	232	398	283	63	56
20	37	48	139	154	100	283	610	232	368	283	80	48
21	37	48	172	154	100	283	465	258	339	283	80	48
22	37	80	465	139	100	232	398	258	339	283	80	48
23	37	63	535	124	100	232	339	283	311	283	72	48
24	37	189	610	124	100	232	398	339	339	232	72	48
25	37	232	398	124	100	189	339	398	432	189	63	48
26	37	283	465	112	112	189	283	339	465	189	56	48
27	37	154	398	112	112	189	283	311	398	172	72	48
28	37	189	339	100	112	172	283	311	339	154	90	48
29	48	283	232	100	100	172	283	311	398	154	90	48
30	48	232	189	90	......	154	283	311	500	154	80	48
31	48	......	189	80	......	154	......	283	......	154	72	......
1908–9.												
1	48	63	100	100	90	124	139	154	730	154	112	56
2	48	124	100	100	90	124	139	232	770	258	100	56
3	48	37	90	172	112	124	124	283	770	283	100	56
4	48	124	90	189	112	124	124	311	572	258	100	56
5	48	100	80	154	124	124	124	339	500	232	90	56
6	42	80	80	154	124	112	112	311	465	232	90	56
7	42	80	72	100	124	112	112	172	465	232	90	56
8	42	72	80	90	112	112	112	139	432	210	72	48
9	42	56	72	90	112	112	112	139	368	210	72	48
10	42	56	72	90	112	112	124	139	398	210	72	48

Daily discharge, in second-feet, of Johnson Creek near Lewis, Wash., for the years ending Sept. 30, 1908–1911—Continued.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1908-9—Con.												
11	42	56	72	90	100	100	112	189	535	210	72	48
12	42	56	100	80	100	100	124	189	572	210	72	48
13	48	56	100	72	100	100	124	172	465	189	72	48
14	100	56	90	63	100	100	124	172	465	189	72	48
15	80	56	72	90	100	112	124	189	535	189	72	48
16	63	56	80	124	139	112	112	189	465	189	72	42
17	63	80	72	232	232	124	112	210	465	154	72	42
18	56	154	63	339	232	124	112	210	398	154	72	42
19	63	124	63	535	189	124	112	210	398	154	63	42
20	100	154	63	690	172	112	112	210	398	154	63	90
21	90	154	63	610	154	112	112	210	432	154	63	72
22	80	172	63	432	139	112	112	210	398	139	63	80
23	72	172	72	311	139	100	100	232	398	139	63	63
24	72	124	63	258	139	100	112	232	398	139	63	56
25	72	124	80	232	139	100	124	283	398	139	63	56
26	63	112	112	189	124	124	189	311	283	124	72	48
27	63	100	139	124	124	124	189	432	283	124	63	48
28	63	100	189	100	124	139	189	465	283	124	63	48
29	63	100	154	100	......	139	172	339	154	112	63	56
30	124	100	124	90	......	139	154	339	154	112	63	56
31	124	......	100	90	......	139	......	398	......	112	63	......
1909-10.												
1	56	63	690	124	232	850	232	368	398	139	63	48
2	48	339	610	124	189	1,310	232	339	339	154	63	56
3	48	940	535	112	172	770	232	339	339	124	56	56
4	48	465	339	112	139	690	189	398	311	124	56	56
5	48	339	339	100	139	465	189	398	258	124	56	56
6	63	283	283	100	124	398	189	398	258	154	56	56
7	56	232	189	100	100	339	232	535	258	154	56	48
8	56	232	189	100	90	283	232	610	232	172	63	37
9	63	189	189	90	80	283	232	572	232	172	63	42
10	63	189	189	90	80	232	232	690	189	189	63	42
11	63	154	189	90	80	311	283	572	465	189	56	42
12	63	154	535	90	80	339	339	535	398	139	56	42
13	63	139	465	90	80	535	339	535	398	124	56	37
14	63	112	398	80	80	572	311	465	311	112	56	37
15	56	112	339	80	80	535	283	398	283	124	48	37
16	56	112	283	80	72	610	283	398	232	124	48	37
17	48	112	232	80	72	690	283	398	232	124	48	42
18	42	398	189	80	72	690	368	368	189	112	56	37
19	37	1,030	172	80	72	770	500	339	232	112	56	37
20	42	572	172	80	72	770	535	339	232	112	56	37
21	63	535	154	90	72	770	535	339	189	112	63	37
22	56	1,830	124	112	72	690	465	339	189	112	56	37
23	56	1,410	112	465	72	690	500	398	189	112	63	33
24	56	1,410	112	398	100	572	610	398	154	100	48	33
25	56	940	112	339	112	465	810	465	154	90	48	33
26	48	690	100	311	90	398	770	432	189	90	48	33
27	48	690	100	232	232	339	610	398	189	80	48	33
28	48	690	90	232	232	339	535	339	172	80	48	37
29	48	940	80	232	......	311	465	339	154	72	48	37
30	48	690	124	232	......	283	398	368	139	72	48	37
31	63	......	124	232	......	258	......	368	......	63	48	......
1910-11.												
1	63	90	189	118	105	60	232	232	690	232	81	60
2	63	90	339	118	92	60	232	258	610	232	81	51
3	283	100	398	118	92	60	232	283	535	258	70	51
4	232	90	398	118	92	60	189	368	432	283	70	44
5	154	189	339	118	92	60	170	398	368	232	70	51
6	154	80	339	135	81	60	152	398	368	283	60	51
7	172	232	398	170	81	70	152	339	398	232	70	51
8	154	232	283	170	81	70	152	283	368	210	70	51
9	154	210	232	152	70	70	152	283	398	189	70	70
10	139	1,030	189	152	70	70	152	232	465	189	70	60

Daily discharge, in second-feet, of Johnson Creek near Lewis, Wash., for the years ending Sept. 30, 1908–1911—Continued.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1910–11—Con.												
11	124	850	232	135	70	70	152	189	610	170	70	51
12	112	690	210	135	70	70	135	283	730	170	70	48
13	80	339	189	118	70	70	118	283	690	170	70	44
14	80	258	189	105	70	70	118	232	610	189	60	48
15	80	210	189	105	70	81	118	232	535	189	60	51
16	80	189	152	105	60	92	118	283	465	210	60	72
17	124	189	135	118	70	105	118	283	465	170	60	92
18	124	170	105	152	70	135	135	339	398	170	60	81
19	124	152	105	152	70	135	135	368	368	152	60	70
20	112	311	105	152	70	189	135	339	339	152	60	70
21	90	850	105	135	70	232	118	339	339	135	60	70
22	80	770	70	118	70	232	170	368	368	118	60	65
23	80	610	118	118	70	283	189	339	308	105	60	60
24	100	398	118	118	70	283	189	339	283	135	60	56
25	154	398	170	105	70	232	339	283	258	118	51	51
26	154	339	170	105	70	189	311	283	368	105	51	51
27	139	283	152	105	70	152	283	283	339	92	51	51
28	124	232	152	105	60	152	232	283	283	92	51	51
29	100	232	135	92	......	152	232	339	283	92	51	51
30	100	232	152	92	......	152	232	398	258	92	51	48
31	90	......	152	105	......	189	......	572	......	81	51	......

NOTE.—Discharge determined from two rating curves fairly well defined below 850 second-feet.

Monthly discharge of Johnson Creek near Lewis, Wash., for 1907–1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1907.					
August 21–31	63	56	62.4	1,360	C
September	80	48	55.6	3,310	C.
The period	....	....	....	4,670	
1907–8.					
October	48	37	44.8	2,750	C.
November	283	37	88.2	5,250	B.
December	610	124	239	14,700	B.
January	172	80	136	8,300	B.
February	124	90	104	5,980	B.
March	1,510	80	278	17,100	B.
April	690	124	266	15,800	B.
May	465	232	298	18,300	B.
June	690	232	439	26,100	B.
July	535	154	333	20,500	B.
August	154	63	95.0	5,840	C.
September	63	48	54.9	3,270	C.
The year	1,510	37	198	144,000	
1908–9.					
October	124	42	64.3	3,950	C.
November	172	37	96.6	5,750	C.
December	189	63	89.4	5,500	C.
January	690	63	196	12,100	B.
February	232	90	131	7,280	B.
March	139	100	117	7,190	B.
April	189	100	128	7,620	B.
May	465	139	245	15,100	B.
June	770	154	445	26,500	B.
July	283	112	177	10,900	B.
August	112	63	74.3	4,570	C.
September	90	42	53.9	3,210	C.
The year	770	37	151	110,000	

Monthly discharge of Johnson Creek near Lewis, Wash., for 1907–1911—Continued.

Month.	Discharge in second-feet.			Run-off (total in acre-feet.)	Accuracy.
	Maximum.	Minimum.	Mean.		
1909–10.					
October	63	37	53.9	3,310	C.
November	1,830	63	533	31,700	B.
December	690	80	250	15,400	B.
January	465	80	153	9,410	B.
February	232	72	110	6,110	B.
March	1,310	232	534	32,800	B.
April	810	189	380	22,600	B.
May	690	339	425	26,100	B.
June	465	139	250	14,900	B.
July	189	63	121	7,440	B.
August	63	48	54.7	3,360	C.
September	56	33	41.1	2,450	C.
The year	1,830	33	243	176,000	
1910–11.					
October	283	63	123	7,560	B.
November	1,030	80	335	19,900	B.
December	398	70	200	12,300	B.
January	170	92	124	7,620	B.
February	105	60	74.9	4,160	B.
March	283	60	126	7,750	B.
April	339	118	180	10,700	B.
May	572	189	314	19,300	B.
June	730	258	433	25,800	B.
July	283	81	169	10,400	B.
August	81	51	62.5	3,840	B.
September	92	44	57.4	3,420	B.
The year	1,030	44	183	133,000	

CISPUS RIVER NEAR RANDLE, WASH.

Location.—In sec.18, T. 11 N., R. 8 E., one-fourth mile below McCoy Creek, and about 12 miles southeast of Randle.

Records available.—October 25, 1910, to September 30, 1911.

Drainage area.—341 square miles.

Gage.—Vertical staff on left bank.

Channel.—Coarse gravel and rocks, shifting.

Discharge measurements.—Made from a cable 25 feet below the gage.

Accuracy.—Results good.

Discharge measurements of Cispus River near Randle, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 25	E. S. Fuller	1.93	977	Mar. 24	H. P. Gilkey	3.22	1,930
Nov. 28	H. P. Gilkey	2.95	1,650	Aug. 12	Charles Leidl	2.08	408

Daily gage height, in feet, of Cispus River near Randle, Wash., for the year ending Sept. 30, 1911.

[Mrs. Hattie Whaley, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	1.5	2.7	2.5	2.3	1.9	......	3.3	4.5	2.8	2.2	1.9
2	......	1.5	3.2	2.5	2.3	1.9	......	3.4	4.5	2.8	2.2	1.9
3	......	1.6	3.4	2.5	2.2	2.0	......	3.8	4.1	2.9	2.2	1.9
4	......	1.5	3.4	2.4	2.2	2.0	......	4.7	3.8	2.9	2.1	1.9
5	......	1.5	3.3	2.4	2.2	2.0	......	4.5	3.6	2.8	2.1	2.0
6	......	1.6	3.2	2.6	2.2	2.1	......	4.1	3.6	2.9	2.1	1.9
7	......	2.4	3.2	2.7	2.1	2.1	......	3.8	3.6	2.7	2.1	1.9
8	......	2.3	3.3	2.7	2.1	2.1	......	3.6	3.5	2.6	2.1	1.9
9	......	2.3	3.1	2.7	2.1	2.1	......	3.5	3.5	2.6	2.1	2.5
10	......	6.0	3.0	2.6	2.2	2.1	......	3.3	3.6	2.6	2.1	2.1
11	......	4.7	2.9	2.6	2.2	2.1	......	3.3	4.1	2.6	2.0	1.9
12	......	3.9	2.8	2.5	2.2	2.1	......	3.3	4.1	2.6	2.0	1.9
13	......	3.6	2.7	2.4	2.1	2.1	......	3.3	4.1	2.6	2.0	1.9
14	......	3.4	2.7	2.4	2.1	2.1	......	3.2	4.0	2.6	2.0	1.9
15	......	3.0	2.7	2.4	2.1	......	......	3.3	4.0	2.6	2.0	2.2
16	......	2.8	......	2.4	2.0	......	2.5	3.5	3.9	2.6	2.0	2.5
17	......	2.7	......	2.4	2.0	......	2.6	3.6	3.6	2.5	2.0	2.4
18	......	2.6	2.6	2.6	2.0	......	2.7	4.0	3.4	2.5	2.0	2.2
19	......	2.8	2.6	2.6	2.0	......	2.7	4.0	3.3	2.5	2.0	2.2
20	......	2.9	2.5	2.5	2.0	2.9	2.7	3.8	3.2	2.4	2.0	2.2
21	......	5.2	2.5	2.5	2.0	3.0	2.8	3.8	3.1	2.4	2.0	2.1
22	......	4.3	2.5	2.4	2.0	3.1	2.8	3.8	3.1	2.3	2.0	2.1
23	......	3.9	2.6	2.4	2.0	......	2.9	3.7	3.1	2.3	2.0	2.0
24	......	3.6	2.6	2.4	2.0	......	3.2	3.6	3.0	2.3	2.0	2.0
25	1.9	3.4	2.5	2.4	2.0	......	3.7	3.5	2.9	2.3	2.0	2.0
26	1.7	3.2	2.5	2.3	1.9	......	3.5	3.3	2.9	2.3	2.0	2.0
27	1.7	3.1	2.5	2.3	1.9	......	3.2	3.3	3.2	2.3	1.9	2.0
28	1.6	2.9	2.5	2.3	1.9	......	3.1	3.4	3.1	2.2	1.9	1.9
29	1.6	2.8	2.5	2.2	......	......	3.2	3.5	2.9	2.2	1.9	1.9
30	1.5	2.8	2.5	2.2	......	......	3.1	3.9	2.9	2.2	1.9	1.9
31	1.5	......	2.5	2.3	......	......	......	4.2	......	......	1.9	......

Daily discharge, in second-feet, of Cispus River near Randle, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	705	1,420	1,250	1,090	820	3,100	2,020	3,600	920	460	325
2	......	705	1,910	1,250	1,090	820	3,000	2,140	3,600	920	460	325
3	......	765	2,140	1,250	1,020	880	2,900	2,640	2,830	1,030	460	325
4	......	705	2,140	1,170	1,020	880	2,700	3,890	2,310	1,030	410	325
5	......	705	2,020	1,170	1,020	880	2,600	3,600	1,980	920	410	365
6	......	765	1,910	1,330	1,020	950	2,300	3,040	1,980	1,030	410	325
7	......	1,350	1,910	1,420	950	950	2,000	2,640	1,980	820	410	325
8	......	1,260	2,020	1,420	950	950	1,700	2,380	1,820	730	410	325
9	......	1,260	1,800	1,420	950	950	1,600	2,260	1,820	730	410	650
10	......	6,400	1,700	1,330	1,020	950	1,500	2,020	1,980	730	410	410
11	......	3,890	1,600	1,330	1,020	950	1,500	2,020	2,830	730	365	325
12	......	2,770	1,510	1,250	1,020	950	1,400	2,020	2,830	730	365	325
13	......	2,380	1,420	1,170	950	950	1,300	2,020	2,830	730	365	325
14	......	2,140	1,420	1,170	950	950	1,300	1,910	2,650	750	365	325
15	......	1,700	1,420	1,170	950	1,000	1,250	2,020	2,650	730	365	460
16	......	1,510	1,300	1,170	880	1,100	1,250	2,260	2,480	730	365	650
17	......	1,420	1,500	1,170	880	1,250	1,330	2,380	1,980	650	365	580
18	......	1,330	1,330	1,330	880	1,400	1,420	2,900	1,670	650	365	460
19	......	1,510	1,330	1,330	880	1,500	1,420	2,900	1,530	650	365	460
20	......	1,600	1,250	1,250	880	1,600	1,420	2,640	1,390	580	365	460
21	......	4,700	1,250	1,250	880	1,700	1,510	2,640	1,260	580	365	410
22	......	3,320	1,250	1,170	880	1,800	1,510	2,640	1,260	520	365	410
23	......	2,770	1,330	1,170	880	2,400	1,600	2,510	1,260	520	365	365
24	......	2,380	1,330	1,170	880	3,000	1,910	2,380	1,140	520	365	365
25	950	2,140	1,250	1,170	880	2,800	2,510	2,260	1,030	520	365	365
26	825	1,910	1,250	1,090	820	2,600	2,260	2,020	1,030	520	365	365
27	825	1,800	1,250	1,090	820	2,300	1,910	2,020	1,390	520	325	365
28	765	1,600	1,250	1,090	820	2,100	1,800	2,140	1,260	460	325	325
29	765	1,510	1,250	1,020	......	1,900	1,910	2,260	1,030	460	325	325
30	705	1,510	1,250	1,020	......	1,900	1,800	2,770	1,030	460	325	325
31	705	......	1,250	1,090	......	2,500	......	3,180	......	460	325	......

NOTE.—Discharge determined from three poorly-defined rating curves. Discharge Mar. 15 to 19, and Mar. 23 to Apr. 15, 1911, estimated by comparison with Cowlitz River at Randle.

Monthly discharge of Cispus River near Randle, Wash., for the year ending Sept. 30, 1911.

[Drainage area, 341 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October 25-31	950	705	791	2.32	0.60	11,000	A.
November	6,400	705	1,950	5.72	6.38	116,000	B.
December	2,140	1,250	1,510	4.43	5.11	92,800	B.
January	1,420	1,020	1,220	3.58	4.13	75,000	B.
February	1,090	820	939	2.75	2.86	52,100	B.
March	3,000	820	1,470	4.31	4.97	90,400	C.
April	3,100	1,250	1,860	5.45	6.08	111,000	C.
May	3,890	1,910	2,470	7.24	8.35	152,000	C.
June	3,600	1,030	1,950	5.72	6.38	116,000	C.
July	1,030	460	687	2.01	2.32	42,200	B.
August	460	325	378	1.11	1.28	23,200	A.
September	650	325	390	1.14	1.27	23,200	A.
The period						905,000	

TOUTLE RIVER NEAR CASTLE ROCK, WASH.

Location.—Near the quarter corner between secs. 12 and 13, T. 10 N., R. 1 W., about 2½ miles below the South Fork and Outlet Creek, and about 8 miles northeast of Castle Rock.

Records available.—September 4, 1909, to September 30, 1911.

Drainage area.—474 square miles.

Gage.—Vertical staff.

Channel.—Rocks and gravel; practically permanent.

Discharge measurements.—Made from a cable near gage or by wading.

Accuracy.—Results good.

Discharge measurements of Toutle River near Castle Rock, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
1910. Dec. 4	John Dubuis	4.05	4,230	1911. Aug. 18[a]	J. R. Thompson	1.00	399

[a] Float measurement.

Daily gage height, in feet, of Toutle River near Castle Rock, Wash., for the year ending Sept. 30, 1911.

[G. K. Walker, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.02	1.46	....	2.85	2.45	1.75	2.60	2.25	3.4	2.05	1.35	0.85
2	1.60	1.50	....	2.75	2.55	1.75	2.60	2.35	3.3	2.05	1.35	.85
3	3.51	1.48	....	2.55	2.45	1.75	2.60	2.60	2.95	2.05	1.25	.85
4	4.15	1.72	3.90	2.80	2.40	1.70	2.40	3.9	2.85	2.00	1.15	.95
5	3.20	1.60	4.00	2.85	2.30	1.70	2.30	3.7	2.65	2.05	1.15	1.05
6	2.48	1.82	3.85	2.80	2.25	1.85	2.15	3.6	2.55	2.05	1.15	1.25
7	2.17	1.90	3.75	3.1	2.25	2.05	2.10	3.0	2.55	1.95	1.10	1.15
8	1.90	2.98	3.55	3.0	2.15	2.05	2.05	3.0	2.65	1.95	1.05	1.00
9	1.93	5.00	3.70	3.4	2.15	2.10	2.10	2.95	2.50	1.85	1.05	1.25
10	2.00	7.34	3.45	3.1	2.15	2.15	2.45	3.2	2.55	1.75	1.05	1.45
11	1.87	6.60	3.25	3.1	2.25	2.25	2.30	2.75	2.85	1.70	1.05	1.45
12	1.84	5.90	3.09	2.75	2.20	2.20	2.15	2.75	3.2	1.70	1.05	1.15
13	1.77	4.00	2.90	2.35	2.30	1.95	2.15	3.9	3.0	1.70	1.05	1.65
14	1.75	3.40	2.80	2.45	2.35	1.90	2.15	3.3	3.0	1.75	.95	1.55
15	1.60	3.00	2.62	2.35	2.35	1.95	2.15	3.2	2.95	1.75	.90	1.95
16	1.58	2.70	2.60	2.35	2.25	2.05	2.15	3.0	2.65	1.75	.90	2.45
17	1.79	2.55	2.54	2.45	2.15	2.20	2.15	3.2	2.55	1.60	.85	2.55
18	2.46	2.44	2.46	3.7	2.55	2.25	2.25	4.1	2.45	1.55	.95	1.95
19	2.10	2.60	2.37	5.1	2.25	2.35	2.45	3.8	2.35	1.45	.95	1.75
20	1.90	3.90	2.31	3.9	2.20	2.45	2.35	3.3	2.25	1.45	1.05	1.55
21	1.80	8.50	2.31	3.5	2.15	2.65	2.25	3.5	2.15	1.40	1.05	1.45
22	1.70	....	2.22	3.1	2.15	2.80	2.25	3.3	2.15	1.40	1.05	1.40
23	1.80	....	2.52	2.90	2.10	2.90	2.25	3.5	2.10	1.35	.95	1.35
24	1.68	....	3.00	2.75	2.05	3.1	2.40	3.3	2.05	1.35	.95	1.30
25	2.00	....	2.90	2.65	2.05	3.3	2.60	3.4	2.10	1.35	.95	1.25
26	1.90	....	2.85	2.55	1.85	2.75	2.55	3.0	2.35	1.40	.95	1.15
27	1.75	....	2.80	2.55	1.90	2.55	2.45	2.90	2.45	1.40	.95	1.25
28	1.65	....	2.79	2.35	1.85	2.45	2.35	2.85	2.15	1.35	.90	1.20
29	1.58	....	3.70	2.32	....	2.35	2.25	2.75	2.25	1.35	.90	1.15
30	1.50	....	3.37	2.45	....	2.40	2.25	2.90	2.15	1.40	.90	1.15
31	1.48	....	3.27	2.45	....	2.45	....	3.2	....	1.35	.85	....

Daily discharge, in second-feet, of Toutle River near Castle Rock, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	418	636	2,460	2,060	1,520	820	1,710	1,280	2,970	1,080	550	320
2	730	660	2,800	1,920	1,640	820	1,710	1,400	2,800	1,080	550	320
3	3,170	648	3,330	1,640	1,520	820	1,710	1,710	2,220	1,080	495	320
4	4,450	816	3,900	1,990	1,460	780	1,460	3,920	2,060	1,030	445	360
5	2,630	730	4,130	2,060	1,340	780	1,340	3,520	1,780	1,080	445	400
6	1,560	896	3,820	1,990	1,280	900	1,180	3,330	1,640	1,080	445	495
7	1,220	960	3,620	2,460	1,280	1,080	1,130	2,300	1,640	985	420	445
8	960	2,270	3,240	2,300	1,180	1,080	1,080	2,300	1,780	985	400	380
9	987	2,300	3,520	2,970	1,180	1,130	1,130	2,220	1,580	900	400	495
10	1,050	17,200	3,060	2,460	1,180	1,180	1,520	2,630	1,640	820	400	610
11	936	11,800	2,720	2,460	1,280	1,280	1,340	1,920	2,060	780	400	610
12	912	9,210	2,440	1,920	1,230	1,230	1,180	1,920	2,630	780	400	445
13	856	4,130	2,140	1,400	1,340	985	1,180	3,920	2,300	780	400	745
14	840	2,970	1,990	1,520	1,400	940	1,180	2,800	2,300	820	360	675
15	730	2,300	1,740	1,400	1,400	985	1,180	2,630	2,220	820	340	985
16	716	1,850	1,710	1,400	1,280	1,080	1,180	2,300	1,780	820	340	1,520
17	872	1,640	1,610	1,520	1,180	1,230	1,180	2,630	1,640	710	320	1,640
18	1,530	1,510	1,530	3,520	1,640	1,280	1,280	4,340	1,520	675	360	985
19	1,150	1,710	1,430	6,770	1,280	1,400	1,520	3,720	1,400	610	360	820
20	960	3,920	1,360	3,920	1,230	1,520	1,400	2,800	1,280	610	400	675
21	880	20,600	1,360	3,150	1,180	1,780	1,280	3,150	1,180	580	400	610
22	800	12,600	1,270	2,460	1,180	1,990	1,280	2,800	1,180	580	400	580
23	880	7,330	1,610	2,140	1,130	2,140	1,280	3,150	1,130	550	360	550
24	786	5,250	2,300	1,920	1,080	2,460	1,460	2,800	1,080	550	360	520
25	1,050	3,720	2,140	1,780	1,080	2,800	1,710	2,970	1,130	550	360	495
26	960	3,150	2,060	1,640	900	1,920	1,640	2,300	1,400	580	360	445
27	840	2,630	1,990	1,640	940	1,640	1,520	2,140	1,520	580	360	495
28	765	2,460	1,980	1,400	900	1,520	1,400	2,060	1,180	550	340	470
29	716	2,300	3,520	1,360	....	1,400	1,280	1,920	1,280	550	340	445
30	660	2,300	2,920	1,520	....	1,460	1,280	2,140	1,180	580	340	445
31	648	....	2,750	1,520	....	1,520	....	2,630	....	550	320	....

Note.—Discharge determined from a rating curve fairly well defined below 5,000 second-feet.

Monthly discharge of Toutle River near Castle Rock., Wash., for the year ending Sept. 30, 1911.

[Drainage area, 474 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	4,450	418	1,150	2.43	2.80	70,700	A.
November	20,600	636	4,350	9.18	10.24	259,000	B.
December	4,130	1,270	2,470	5.21	6.01	152,000	B.
January	6,770	1,360	2,200	4.64	5.35	135,000	A.
February	1,640	900	1,260	2.66	2.77	70,000	A.
March	2,800	780	1,350	2.85	3.29	83,000	A.
April	1,710	1,080	1,360	2.87	3.20	80,900	A.
May	4,340	1,280	2,630	5.55	6.40	162,000	A.
June	2,970	1,080	1,720	3.63	4.05	102,000	A.
July	1,080	550	765	1.61	1.86	47,000	B.
August	550	320	393	.830	.96	24,200	B.
September	1,640	320	610	1.29	1.44	36,300	B.
The year	20,600	320	1,690	3.57	48.37	1,220,000	

CHEHALIS RIVER BASIN.

CHEHALIS RIVER AT CENTRALIA, WASH.

Location.—At the highway bridge a few hundred yards above Skookemchuck River, about three-fourths of a mile southwest of Centralia.

Records available.—October 3, 1910, to October 4, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Sand and gravel; shifting.

Discharge measurements.—Made from the bridge or from a boat below the gage.

Estimates withheld for additional data.

Discharge measurements of Chehalis River at Centralia, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 3	F. F. Henshaw	8.67	4,890	Apr. 8	F. F. Henshaw	2.30	846
Dec. 2	John Dubuis	5.55	3,770	Aug. 6	W. O. Harmon	[a] .96	204

[a] Gage read about 0.06 foot high, on account of upstream wind.

Daily gage height, in feet, of Chehalis River at Centralia, Wash., for Oct. 9, 1910, to Oct. 4, 1911.

[John Arveson, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	......	2.8	5.6	6.0	5.3	2.9	3.2	2.30	2.30	1.65	0.90	0.85	1.00
2	......	2.5	5.6	5.3	4.7	2.8	3.1	2.30	2.20	1.40	.90	.90	1.00
3	......	3.2	6.7	4.7	4.4	2.8	2.9	2.7	2.15	1.40	.95	.90	.95
4	......	3.3	7.8	4.6	4.2	2.7	2.7	5.1	2.20	1.50	.90	1.00	.90
5	......	3.2	8.4	4.2	4.1	3.2	2.8	5.6	2.10	1.50	.90	1.10	......
6	......	2.9	9.4	4.0	4.1	3.1	2.7	5.4	1.90	1.30	.90	1.05	......
7	......	3.6	8.5	4.0	3.8	3.6	2.5	4.5	2.05	1.35	.95	1.00	......
8	......	7.4	7.6	3.8	3.8	4.2	2.30	4.0	1.70	1.30	.95	1.05	......
9	4.6	6.3	7.4	5.1	3.9	4.2	2.6	3.7	1.80	1.30	1.05	1.40	......
10	4.55	12.4	6.45	5.6	3.8	4.0	3.4	3.8	1.80	1.25	1.00	1.95	......
11	4.15	14.6	5.6	5.1	4.6	4.3	4.0	3.4	1.90	1.25	1.00	1.40	......
12	3.75	11.75	4.9	4.6	4.4	4.0	4.4	3.8	1.70	1.20	1.00	1.20	......
13	3.45	7.7	4.45	4.0	7.8	3.7	4.0	3.6	1.60	1.25	.90	1.30	......
14	3.25	5.8	4.0	3.6	9.0	3.5	3.8	4.4	1.70	1.10	1.00	1.40	......
15	3.1	4.8	3.8	3.4	7.2	3.3	3.5	3.8	1.60	1.10	1.00	2.50	......
16	3.0	4.1	3.7	3.8	5.9	3.6	3.5	3.5	1.50	1.10	1.00	2.70	......
17	2.9	3.7	3.4	4.0	5.1	3.6	3.3	3.3	1.40	1.00	1.00	2.60	......
18	5.05	3.8	4.0	4.4	5.6	3.5	3.6	6.2	1.40	1.05	1.00	1.90	......
19	4.4	3.95	3.8	11.8	5.5	3.7	4.4	7.6	1.45	1.00	.95	1.50	......
20	3.75	8.0	3.5	10.2	5.0	3.7	3.9	5.7	1.30	1.00	.95	1.30	......
21	3.5	15.1	4.45	7.8	4.6	3.8	3.6	4.7	1.30	1.10	1.00	1.30	......
22	3.3	19.2	3.3	6.2	4.1	3.5	3.4	4.0	1.30	1.05	.95	1.30	......
23	3.2	15.7	4.4	5.5	3.8	3.7	3.0	3.4	1.30	1.00	.95	1.25	......
24	3.05	12.8	7.1	4.8	3.8	4.0	3.0	3.5	1.40	1.00	.90	1.25	......
25	3.15	9.6	7.3	5.4	3.4	6.2	2.8	3.3	1.35	.95	.95	1.20	......
26	3.1	7.0	6.05	5.2	3.5	4.8	2.8	3.0	1.50	.90	.90	1.05	......
27	3.0	5.8	5.9	5.0	3.2	4.1	2.6	2.9	1.90	.90	.85	1.05	......
28	2.8	5.1	5.3	6.0	3.0	3.7	2.5	2.6	1.60	.90	.80	1.00	......
29	2.7	4.4	4.8	5.8	......	3.4	2.20	2.6	1.70	.95	.90	1.10	......
30	2.8	5.8	6.05	5.2	......	3.3	2.40	2.40	1.45	1.05	.85	1.10	......
31	2.5	......	6.8	5.2	......	3.3	......	2.40	......	1.00	.90	......	......

PUGET SOUND DRAINAGE BASINS.

ELWHA RIVER BASIN.

ELWHA RIVER NEAR PORT ANGELES, WASH.

Location.—In sec. 15, T. 30 N., R. 7 W., at the plant of the Olympic Power Co., in Elwha Canyon, 7 miles above Port Angeles.

Records available.—April 10 to September 30, 1911.

Drainage area.—308 square miles.

Gage.—Standard chain.

Channel.—Bowlders and coarse gravel; shifting in floods.

Discharge measurements.—Made from a bridge near the gage.

Accuracy.—Results good.

Cooperation.—Gage-height record furnished by the Olympic Power Co.

Discharge measurements of Elwha River near Port Angeles, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 10	H. P. Gilkey	3.98	1,210	July 16	W. W. Clifford	7.18	3,250
May 14	....do	6.01	1,900	Sept. 18	....do	4.95	691
June 26	....do	7.03	3,480	19	....do	4.95	735

Daily gage height, in feet, and discharge, in second-feet, of Elwha River near Port Angeles, Wash., for the year ending Sept. 30, 1911.

Day.	April.		May.		June.		July.		August.		September.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1			4.65	2,060	7.8	4,450	6.7	2,830	5.80	1,620		644
2			5.10	2,670	7.8	4,450	6.7	2,830	5.70	1,500		707
3			6.9	5,390	7.3	3,700	6.7	2,830	5.70	1,500		770
4					6.8	2,970	6.8	2,970	5.85	1,680		834
5					6.5	2,550	6.6	2,690	5.70	1,500	5.15	898
6					6.6	2,690	7.0	3,260	5.70	1,500	5.05	802
7					6.6	2,690	6.8	2,970	5.60	1,400	5.05	802
8					6.6	2,690	7.2	3,550	5.45	1,200	5.05	802
9					6.7	2,830	7.0	3,260	5.30	1,040	5.40	1,150
10					6.7	2,830	6.5	2,550	5.30	1,040	5.40	1,150
11					6.8	2,970	6.4	2,410	5.40	1,150	5.05	802
12					8.2	5,070	6.3	2,280	5.30	1,040	5.15	898
13					8.3	5,230	6.5	2,550	5.30	1,040	5.10	850
14					7.4	3,850	6.8	2,970	5.20	945	5.15	898
15			6.2	2,140	7.1	3,400	7.1	3,400	5.15	898	6.2	2,140
16	3.50	735	6.5	2,550	6.8	2,970	7.2	3,550	5.10	850	5.60	1,380
17	3.50	735		2,620	6.7	2,830	7.0	3,260	5.10	850	5.25	995
18	3.60	825	6.6	2,690	6.6	2,690	6.9	3,120	5.20	945	5.05	802
19	3.45	692	6.3	2,280	6.5	2,550	6.8	2,970	5.20	945	4.95	712
20	3.42	667	6.1	2,000	6.4	2,410	6.6	2,690	5.00	755	4.85	631
21	3.62	844	6.2	2,140	6.2	2,280	6.4	2,410	5.15	898	4.95	712
22	3.75	970	6.4	2,410	6.4	2,830	6.3	2,280	5.00	755	4.95	712
23	3.72	940	6.3	2,280	6.3	2,970	6.2	2,140	5.00	755	4.85	631
24	4.00	1,240	6.2	2,140	6.2	2,690	6.3	2,280	5.10	850	4.80	592
25	4.55	1,920	6.1	2,000	6.1	2,550	6.3	2,280	5.00	755	4.85	631
26	4.25	1,540	6.1	2,000	6.1	4,300	6.2	2,140	5.20	945	4.85	631
27	4.05	1,300	6.2	2,140	6.2	4,000	6.0	1,870	5.10	850	4.65	488
28	3.90	1,120	6.2	2,140	6.2	3,260	6.0	1,870	5.05	802	4.65	488
29	4.05	1,300	6.4	2,410	6.4	2,970	6.0	1,870	4.60	455	4.65	488
30	4.40	1,730	6.6	2,690	6.6	2,550	5.8	1,620		518	4.65	488
31			7.4	3,850	7.4		5.8	1,620		581		

NOTE.—Discharge Apr. 10 to May 3, 1911, determined from a rating curve well defined between 1,000 and 1,600 second-feet. Discharge May 15 to Sept. 30, 1911, determined from a rating curve well defined below 4,000 second-feet. Discharge interpolated May 17 and Aug. 30 to Sept. 4, 1911.

Monthly discharge of Elwha River near Port Angeles, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April 16-30	1,920	667	1,100	32,700	A.
May 15-31	3,850	2,000	2,380	80,300	A.
June	5,230	2,280	3,210	191,000	A.
July	3,550	1,620	2,620	161,000	A.
August	1,680	455	1,020	62,700	A.
September	2,140	488	818	48,700	A.

DOSEWALLIPS RIVER BASIN.

DOSEWALLIPS RIVER AT BRINNON, WASH.

Location.—In the NE. ¼ sec. 3, T. 23 N., R. 2 W., at the highway bridge in Brinnon, just above tide influence.

Record available.—October 30, 1910, to October 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on right bank.

Discharge measurements.—Made from highway bridge just above gage, or by wading.

Accuracy.—Results good.

Discharge measurements of Dosewallips River at Brinnon, Wash., in 1910–1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Sept. 24	H. P. Gilkey	2.80	187	Feb. 2	H. P. Gilkey	3.79	193
Oct. 30	.....do	2.80	195	Mar. 29	.....do	4.08	318
Dec. 11	.....do	4.59	596	June 8	.....do	4.65	719
				July 11	W. W. Clifford	4.69	754
1911.				Sept. 21	.....do	4.10	225
Jan. 5	H. P. Gilkey	4.00	244	Nov. 15	.....do	4.16	239

Daily gage height, in feet, of Dosewallips River at Brinnon, Wash., for Oct. 30, 1910, to Oct. 31, 1911.

[W. R. Frey, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	......	2.9	......	4.1	3.9	3.6	4.4	4.4	5.0	4.8	4.5	4.1	3.9
2	......	2.9	......	4.1	3.8	3.6	4.3	4.5	5.0	4.7	4.4	4.2	3.8
3	......	2.8	......	4.0	3.8	3.6	4.4	4.7	4.8	4.8	4.4	4.2	4.0
4	......	2.8	......	4.0	3.7	3.7	4.2	5.6	4.8	4.8	4.4	4.2	3.9
5	......	3.1	......	4.0	3.7	3.7	4.1	5.8	4.6	4.8	4.5	4.2	3.9
6	......	3.2	......	4.0	3.7	3.7	4.0	5.0	4.6	4.9	4.4	4.1	3.9
7	......	3.2	......	4.0	3.7	4.0	4.0	5.0	4.6	4.8	4.4	4.0	4.0
8	......	3.2	......	4.0	3.7	4.1	4.0	4.9	4.6	4.7	4.4	4.1	4.0
9	......	3.4	......	4.4	3.7	4.1	4.4	4.8	4.7	4.7	4.4	4.3	4.2
10	......	5.9	4.6	4.2	4.0	4.0	4.4	4.8	4.8	4.7	4.3	4.3	4.2
11	......	4.2	4.6	4.1	4.1	3.9	4.2	4.8	5.1	4.7	4.3	4.2	4.1
12	......	3.6	4.5	4.0	4.1	3.9	4.2	4.8	5.3	4.7	4.2	4.2	4.1
13	......	3.6	4.4	3.9	4.2	3.8	4.0	4.7	5.2	4.8	4.3	4.1	4.2
14	......	3.4	4.3	3.9	4.0	3.8	4.0	4.7	5.2	4.8	4.3	4.2	4.4
15	......	3.3	4.3	3.9	3.9	4.1	4.0	4.7	5.1	4.9	4.2	4.5	4.4
16	......	2.9	4.4	4.0	3.8	4.2	4.1	4.8	5.0	4.9	4.2	4.4	4.2
17	......	2.9	4.3	4.4	3.8	4.3	4.1	4.9	5.0	4.8	4.2	4.2	4.2
18	......	2.9	4.3	4.4	3.8	4.3	4.1	5.0	4.8	4.8	4.2	4.2	4.1
19	......	3.0	4.3	4.2	3.8	4.2	4.0	4.8	4.8	4.8	4.3	4.2	4.0
20	......	6.2	4.3	4.2	3.8	4.4	4.0	4.7	4.8	4.7	4.3	4.1	4.0
21	......	5.6	4.2	4.1	3.8	4.4	4.1	4.7	4.8	4.6	4.2	4.1	4.0
22	......	5.1	4.2	4.0	3.7	4.4	4.2	4.8	4.8	4.6	4.2	4.2	4.0
23	......	4.7	4.8	4.0	3.7	4.5	4.3	4.7	4.8	4.6	4.2	4.0	4.0
24	......	......	4.7	4.0	3.7	4.4	4.4	4.6	4.8	4.5	4.1	4.0	4.0
25	......	......	4.6	4.0	3.7	4.3	4.5	4.7	4.8	4.6	4.2	4.0	3.9
26	......	......	4.4	3.9	3.7	4.2	4.4	4.6	5.1	4.6	4.2	4.0	3.9
27	......	......	4.3	4.0	3.7	4.2	4.4	4.6	5.0	4.6	4.2	3.9	3.8
28	......	......	4.2	4.0	3.6	4.1	4.3	4.6	4.9	4.6	4.2	3.9	3.9
29	......	......	4.2	3.9	......	4.1	4.3	4.8	4.8	4.6	4.2	3.9	3.9
30	2.8	......	4.2	4.2	......	4.2	4.3	4.8	4.7	4.5	4.3	3.9	3.9
31	2.8	......	4.2	4.1	......	4.3	......	5.0	......	4.5	4.2	......	3.9

Daily discharge, in second-feet, of Dosewallips River at Brinnon, Wash., for Oct. 30, 1910, to Oct. 31, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	......	231	......	292	236	128	516	516	1,070	857	586	255	144
2	......	231	......	292	196	128	448	590	1,070	760	508	295	116
3	......	191	......	244	196	128	516	760	857	857	504	293	178
4	......	191	......	244	160	160	386	1,860	857	857	500	290	144
5	......	326	......	244	160	160	330	2,160	671	857	570	288	144
6	......	381	......	244	160	160	280	1,070	671	960	492	240	144
7	......	381	......	244	160	280	280	1,070	671	857	488	196	178
8	......	381	......	244	160	330	280	960	671	760	484	236	178
9	......	513	......	462	160	330	516	857	760	760	480	330	260
10	......	4,290	600	344	280	280	516	857	857	760	415	328	260
11	......	1,360	600	292	330	236	386	857	1,180	760	412	262	217
12	......	675	528	244	330	236	386	857	1,440	760	354	260	217
13	......	675	462	202	386	196	280	760	1,300	857	408	220	260
14	......	513	400	202	280	196	280	760	1,300	857	406	257	360
15	......	443	400	202	236	330	280	760	1,180	960	345	420	360
16	......	231	462	244	196	386	330	857	1,070	960	342	360	260
17	......	231	400	462	196	448	330	960	1,070	857	340	260	260
18	......	231	400	462	196	448	330	1,070	857	857	337	260	217
19	......	276	400	344	196	386	280	857	857	857	396	260	178
20	......	4,920	400	344	196	516	280	760	857	760	394	217	178
21	......	1,750	344	292	196	516	330	760	857	671	326	217	178
22	......	1,100	344	244	160	516	386	857	857	671	324	260	178
23	......	680	770	244	160	590	448	760	857	671	321	178	178
24	......	......	680	244	160	516	516	671	857	590	270	178	178
25	......	......	600	244	160	448	590	760	857	671	315	178	144
26	......	......	462	236	160	386	516	671	1,180	671	312	178	144
27	......	......	400	280	160	386	516	671	1,070	671	310	144	116
28	......	......	344	280	128	330	448	671	960	671	307	144	144
29	......	......	344	236	......	330	448	857	857	671	305	144	144
30	......	......	344	386	......	386	448	857	760	590	354	144	144
31	191	......	344	330	......	448	......	1,070	......	590	300	......	144

NOTE.—Discharge determined from several rating curves as follows: Oct. 30 to Nov. 20, 1910, fairly well defined between 150 and 500 second-feet; Nov. 21, 1910, to Jan. 25, 1911, well defined below 1,000 second-feet; Jan. 26 to July 31, 1911, well defined below 1,200 second-feet; Aug. 1 to Sept. 14, 1911, shifting channel methods; Sept. 15 to Oct. 31, 1911, fairly well defined. Discharge Nov. 24 to 30, 1910, estimated as 550 second-feet per day, and Dec. 1 to 9, 1911, estimated as 1,570 second-feet, determined from a study of precipitation records.

Monthly discharge of Dosewallips River at Brinnon, Wash., for the year ending Oct. 31, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
November	4,920	191	802	47,700	D.
December	....	344	779	47,900	C.
January	462	202	286	17,600	B.
February	386	128	203	11,300	A.
March	590	128	333	20,500	A.
April	590	280	396	23,600	A.
May	2,160	516	897	55,200	A.
June	1,440	671	946	56,300	A.
July	960	590	771	47,400	A.
August	586	270	394	24,200	B.
September	420	144	243	14,500	B.
October	360	116	192	11,800	B.
The year	4,920	116	522	378,000	

DUCKABUSH RIVER BASIN.

DUCKABUSH RIVER NEAR DUCKABUSH, WASH.

Location.—In the SW. ¼ sec. 1, T. 25 N., R. 3 W., three-fourths of a mile above the Duckabush ranger station, and about 6 miles above Duckabush.

Records available.—August 19, 1910, to September 30, 1911.

Drainage area.—81 square miles.

Gage.—Vertical staff in two sections on left bank. Datum lowered 0.73 foot on Feb. 3, 1911. Gage heights Jan. 1 to Feb. 2, 1911, have been reduced to new datum.

Channel.—Coarse gravel and small bowlders; shifting.

Discharge measurements.—Made from cable 100 feet above the gage.

Estimates withheld for further data.

Discharge measurements of Duckabush River near Duckabush, Wash., in 1910–11.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Sept. 23	H. P. Gilkey...........	3.48	106	Feb. 3	H. P. Gilkey...........	2.47	115
Oct. 30	.....do..................	3.78	125	Mar. 30	.....do..................	3.19	283
Dec. 11	.....do..................	2.77	537	June 9	.....do..................	3.82	572
				July 11	W. W. Clifford.........	3.48	377
1911.				Sept. 21	.....do..................	2.50	143
Jan. 6	H. P. Gilkey...........	2.77	218				

Daily gage height, in feet, of Duckabush River near Duckabush, Wash., for the year ending Sept. 30, 1911.

[E. G. Newman, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	4.40	3.78	......	2.93	2.53	2.45	3.40	3.23	4.6	3.60	3.15	......
2	4.35	3.80	......	......	2.48	2.65	3.35	3.80	4.6	3.65	3.10	......
3	5.41	3.80	......	......	2.47	2.85	3.35	4.5	4.5	3.70	3.10	......
4	5.02	3.78	5.01	......	2.47	2.90	......	6.1	4.5	3.70	3.05	......
5	4.61	3.78	5.02	......	2.46	2.95	......	6.1	4.20	3.80	3.05	......
6	5.03	3.77	4.82	2.83	2.44	3.00	......	5.6	3.75	4.00	3.00	......
7	4.71	5.32	4.83	2.83	2.43	3.05	......	5.2	4.20	3.70	3.00	......
8	4.70	5.35	5.04	2.73	2.40	3.05	......	4.8	4.40	3.60	2.98	......
9	4.81	5.52	4.20	......	2.40	3.05	......	4.20	......	3.60	2.95	......
10	4.68	6.02	3.60	......	2.40	3.05	......	3.80	4.6	3.55	2.87	......
11	4.41	5.01	2.78	......	2.41	3.05	......	......	......	3.50	2.81	......
12	4.21	4.51	2.78	......	2.42	3.00	......	......	......	3.50	2.75	......
13	4.01	4.30	2.75	......	2.42	3.00	......	......	4.8	3.50	2.72	......
14	3.90	4.25	2.74	2.71	2.41	2.98	......	......	4.8	3.80	2.70	3.30
15	3.80	4.15	2.73	2.71	2.40	3.00	3.40	......	4.8	4.00	2.67	3.15
16	3.78	3.80	2.70	2.72	2.40	3.05	3.35	......	4.5	4.10	2.62	2.85
17	4.80	3.80	2.69	2.72	2.42	3.05	3.35	......	4.40	3.95	2.62	2.75
18	4.71	3.78	2.68	2.93	......	3.10	3.35	......	......	3.80	2.62	2.71
19	......	4.01	2.54	2.83	2.42	3.10	......	......	......	3.80	2.62	2.60
20	......	6.00	2.54	2.83	2.43	3.15	......	......	3.90	3.80	2.61	2.55
21	......	6.08	2.50	2.83	2.43	3.20	3.30	......	3.80	3.80	2.61	2.55
22	......	5.47	2.51	2.73	2.42	3.30	3.30	......	3.80	3.60	2.61	2.50
23	4.41	4.31	2.51	2.73	2.41	3.65	3.25	......	3.60	3.50	2.61	2.50
24	4.38	3.62	2.60	2.73	2.43	3.65	3.25	......	3.60	3.40	2.60	2.48
25	4.20	3.02	2.60	2.71	2.40	3.60	3.25	......	3.56	3.30	2.60	2.48
26	4.11	3.01	2.55	2.71	2.39	3.60	3.25	......	3.80	3.20	2.58	2.46
27	4.80	......	2.55	2.71	2.39	3.60	3.25	3.70	3.80	3.20	2.58	2.46
28	......	......	2.68	2.71	2.38	3.50	3.25	3.70	3.90	3.20	2.55	2.45
29	3.80	......	2.55	2.71	......	3.45	3.25	3.85	3.95	3.20	2.55	2.45
30	3.77	......	2.50	2.72	......	......	3.22	4.10	3.70	3.20	......	2.45
31	3.76	......	2.50	2.71	......	......	......	4.5	......	3.17	......	......

SKOKOMISH RIVER BASIN.

NORTH FORK OF SKOKOMISH RIVER NEAR HOODSPORT, WASH.

Location.—In the NW. ¼ SW. ¼ sec. 5, T. 22 N., R. 4 W., at the South Fork trail bridge, 5 miles above Hoodsport.

Records available.—August 17, 1910, to September 22, 1911; fragmentary.

Drainage area.—94 square miles.

Gage.—A vertical staff on the left bank, 25 feet below the bridge.

Channel.—Rocks and gravel; practically permanent.

Discharge measurements.—Made from the bridge, 25 feet above the gage.

Accuracy.—Results poor on account of infrequency of gage readings.

Discharge measurements of North Fork of Skokomish River near Hoodsport, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Nov. 19	H. P. Gilkey	8.35	698	Mar. 31	H. P. Gilkey	8.50	865
				June 10	do	9.03	1,070
1911.				July 12	W. W. Clifford	8.06	695
Jan. 7	H. P. Gilkey	7.78	603	Sept. 22	do	6.28	230

Daily gage height, in feet, of North Fork of Skokomish River near Hoodsport, Wash., for the year ending Sept. 30, 1911.

Day.	Nov.	Dec.	Jan.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1					10.0	11.8		8.6		6.3
2							10.0	8.4		6.3
3		10.6					9.7	8.4		6.3
4								8.4		6.3
5					10.6	11.4		8.4		6.3
6								8.7		6.4
7			7.7					8.5		
8					11.3			8.4		
9							9.9	8.2		
10		10.3		8.2		11.0	9.9	8.0		
11								8.0		
12								8.0		
13				8.3	14.1			8.2		
14										
15			7.6			10.8				
16					13.6					
17		8.6								
18						10.4				
19	8.35			8.3		9.9				
20					13.0	9.5	8.6			
21										
22										6.4
23										
24		8.1		8.5	12.2		8.5			
25							8.4			
26							9.4			
27						10.5	10.0	7.6		
28					12.0		9.6	7.4	6.3	
29							8.8	7.4		
30				8.5		10.6	8.6			
31								7.2	6.3	

Daily discharge, in second-feet, of North Fork of Skokomish River near Hoodsport, Wash., for the year ending Sept. 30, 1910.

Day.	Aug.	Sept.	Day.	Aug.	Sept.	Day.	Aug.	Sept.
1			11			21		156
2			12		228	22		230
3			13			23		
4			14			24		
5		225	15			25		230
6			16			26	223	
7			17	241	230	27		
8			18			28		
9		228	19		230	29	225	
10			20			30		241
						31	223	

Daily discharge, in second-feet, of North Fork of Skokomish River near Hoodsport, Wash., for the year ending Sept. 30, 1911.

Day.	Nov.	Dec.	Jan.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1					1,480	2,360		895		235
2							1,480	815		235
3		1,760					1,350	815		235
4								815		235
5					1,760	2,160		815		235
6								935		255
7			580					855		
8					2,110			815		
9							1,440	745		
10		1,620		745		1,960	1,440	675		
11								675		
12								675		
13				780	3,510			745		
14										
15			550			1,860				
16					3,260					
17		895								
18						1,660				
19	700			780						
20					2,960	1,440	895			
21										
22										235
23										
24		710		855	2,560		855			
25							815			
26							815			
27						1,710	1,480	550		
28					2,460		1,300	490	235	
29							975	490		
30				855		1,700	895			
31								436	235	

NOTE.—Discharge Aug. 17 to Nov. 30, 1910, determined from a poorly defined rating curve. Discharge Dec. 1, 1910, to Sept. 22, 1911, determined from a rating curve well defined between 200 and 1,200 second-feet. No attempt has been made to estimate discharge for days when no gage height was reported, and estimates of monthly discharge are withheld.

NISQUALLY RIVER BASIN.

NISQUALLY RIVER NEAR ASHFORD, WASH.

Location.—In the SW. ¼ sec. 33, T. 15 N., R. 7 E., half a mile below the west boundary of Mount Rainier National Park, and about 7 miles east of Ashford.

Records available.—October 28, 1910, to September 30, 1911.

Drainage area.—73 square miles.

Gage.—A reference point on a footbridge.

Channel.—Sand and gravel; shifting.

Discharge measurements.—Made by wading.

Cooperation.—Gage-height record furnished by officers of the National Park.

Accuracy.—Results fair.

Discharge measurements of Nisqually River near Ashford, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 28	E. S. Fuller	4.70	370	Mar. 21	H. P. Gilkey	4.19	193
Nov. 25	H. P. Gilkey	4.80	429	Sept. 12	W. O. Harmon	4.45	251

Daily gage height, in feet, of Nisqually River near Ashford, Wash., for the year ending Sept. 30, 1911.

[E. S. Hall, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	4.7	4.5	4.1	4.0	3.6	4.3	4.4	4.7	4.3	4.3	......
2	......	4.7	4.8	4.1	3.9	3.6	4.3	4.4	4.6	......	......	......
3	......	4.6	4.7	4.1	3.9	3.6	4.3	4.5	4.3	4.5	......	......
4	......	4.7	4.6	4.2	3.9	3.6	4.2	5.1	......	......	......	......
5	......	4.6	4.6	4.2	3.8	3.6	4.1	5.1	3.6	4.6	......	......
6	......	4.8	4.6	4.3	3.8	3.6	4.1	4.5	3.7	......	......	......
7	......	5.6	4.7	4.4	3.8	3.7	4.1	4.6	......	5.1	......	......
8	......	6.6	4.7	4.3	3.8	3.7	4.1	4.6	......	5.0	......	......
9	......	6.3	4.6	4.3	3.8	3.7	4.1	4.6	4.1	......	......	......
10	......	7.3	4.5	4.2	3.8	3.7	4.2	4.5	......	4.9	......	......
11	......	5.0	4.5	4.2	3.8	3.7	4.1	4.5	......	5.0	......	......
12	......	4.1	4.4	4.2	3.8	3.7	4.0	......	4.6	......	......	4.45
13	......	3.9	4.3	4.1	3.8	3.6	4.0	......	4.5	......	......	......
14	......	3.8	4.3	4.0	3.8	3.6	3.9	......	......	......	4.4	......
15	......	3.8	4.2	4.1	3.8	3.7	4.0	......	4.1	......	......	......
16	......	3.8	4.3	4.1	3.8	3.8	4.0	4.6	......	......	......	......
17	......	3.7	4.2	4.1	3.8	3.9	4.0	4.7	3.8	4.9	......	......
18	......	3.7	4.2	4.3	3.8	4.0	4.0	4.8	......	......	......	......
19	......	3.6	4.2	4.2	3.8	4.0	4.1	4.7	......	......	......	......
20	......	3.8	4.2	4.2	3.7	4.1	4.0	4.7	......	......	......	......
21	......	6.6	4.2	4.1	3.7	4.2	4.1	4.7	3.8	......	......	4.5
22	......	5.9	4.2	4.1	3.7	4.3	4.2	4.6	......	......	......	4.4
23	......	5.3	4.5	4.1	3.7	4.5	4.3	4.6	3.9	......	......	4.3
24	......	5.0	4.5	4.1	3.6	4.4	4.4	4.5	......	5.1	......	4.3
25	......	4.8	4.0	4.0	3.6	4.4	4.6	4.4	......	......	......	4.4
26	......	4.7	4.4	4.0	3.6	4.3	4.5	......	......	4.6	......	4.4
27	......	4.6	4.3	4.0	3.6	4.2	4.4	4.4	......	......	......	4.3
28	4.8	4.5	4.3	4.0	3.6	4.1	4.3	4.4	......	......	......	4.3
29	4.8	4.5	4.2	4.0	......	4.1	4.3	4.5	......	......	......	4.3
30	4.6	4.6	4.2	4.0	......	4.2	4.4	4.8	4.3	......	......	4.3
31	4.6	......	4.2	4.0	......	4.2	......	5.0	......	......	......	......

Daily discharge, in second-feet, of Nisqually River near Ashford, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	370	280	170	152	92	215	245	700	520	215	300
2	......	370	430	170	136	92	215	245	550	540	240	290
3	......	320	370	170	136	92	215	280	480	580	250	280
4	......	370	320	190	136	92	190	640	420	640	240	260
5	......	320	320	190	120	92	170	640	360	750	240	250
6	......	430	320	215	120	92	170	280	410	700	240	250
7	......	1,150	370	245	120	106	170	320	490	640	230	250
8	......	2,400	370	215	120	106	170	320	580	560	230	250
9	......	2,010	320	215	120	106	170	320	660	525	230	750
10	......	3,400	280	190	120	106	190	280	800	490	230	400
11	......	1,500	280	190	120	106	170	280	950	560	240	250
12	......	750	245	190	120	106	152	290	1,100	600	240	262
13	......	650	215	170	120	92	152	300	1,000	650	240	250
14	......	580	215	152	120	92	136	300	880	610	245	220
15	......	580	190	170	120	106	152	310	660	570	270	700
16	......	580	215	170	120	120	152	320	560	530	300	800
17	......	520	190	170	120	136	152	370	460	490	280	650
18	......	520	190	215	120	152	152	430	460	460	250	550
19	......	450	190	190	120	152	170	370	460	440	220	450
20	......	580	190	190	106	170	152	370	460	430	220	350
21	......	2,400	190	170	106	190	170	370	460	420	220	280
22	......	1,510	190	170	106	215	190	320	490	440	240	245
23	......	830	280	170	106	280	215	320	520	500	260	215
24	......	560	280	170	92	245	245	280	500	640	300	215
25	......	430	152	152	92	245	320	245	500	480	320	245
26	......	370	245	152	92	215	280	245	550	320	340	245
27	......	320	215	152	92	190	245	245	650	350	350	215
28	430	280	215	152	92	170	215	245	700	380	350	215
29	430	280	190	152	......	170	215	280	600	360	370	215
30	320	320	190	152	......	190	245	430	520	310	370	215
31	320	......	190	152	......	190	......	500	......	260	330	......

NOTE.—Discharge determined from a rating curve fairly well defined between 150 and 500 second-feet. Discharge Nov. 11 to 20, 1910, and May 31 to July 6, 1911, estimated by hydrograph comparisons with the record of Puyallup River at Election.

Monthly discharge of Nisqually River near Ashford, Wash., for the year ending Sept. 30, 1911.

[Drainage area, 73 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
November	3,400	280	838	11.5	12.83	49,900	C.
December	430	152	253	3.47	4.00	15,600	B.
January	245	152	178	2.44	2.81	10,900	B.
February	152	92	116	1.59	1.66	6,440	C.
March	280	92	145	1.99	2.29	8,920	B.
April	320	136	192	2.63	2.93	11,400	B.
May	640	245	335	4.59	5.29	20,600	B.
June	1,100	360	598	8.19	9.14	35,600	C.
July	750	260	508	6.96	8.02	31,200	C.
August	370	215	268	3.67	4.23	16,500	C.
September	800	215	336	4.60	5.13	20,000	C.
The period	....	....	....	....	....	227,000	

NISQUALLY RIVER AT LA GRANDE, WASH.

Location.—In sec. 32, T. 16 N., R. 4 E., at the site of the Tacoma municipal power plant, at the lower end of Nisqually Canyon at La Grande.

Records available.—September 5, 1906, to September 30, 1911.

Drainage area.—294 square miles.

Gage.—Vertical staff on right wall of canyon at power-house site read since January 1, 1910. Datum is mean sea level. From September 5, 1906, to September 8, 1910, the gage was a vertical staff in two sections on the right bank in sec. 9, T. 15 N., R. 4 E., just below the diversion dam at the head of Nisqually Canyon, and about 4 miles above La Grande.

Channel.—Gravel; somewhat shifting.

Discharge measurements.—Made from bridges near the upper gage.

Accuracy.—Results fair.

Cooperation.—Field data, except discharge measurements for 1910 and 1911, furnished by the city of Tacoma.

Discharge measurements of Nisqually River at La Grande, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 29[a]	E. S. Fuller............	3.05	609	Sept. 4	G. L. Parker...........	512.60	541
29	.....do..................	510.80	862				

[a] Measured at upper gage.

Daily gage height, in feet, of Nisqually River at La Grande, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	11.2	10.4	12.2	11.60	10.90	10.00	11.40	12.40	14.20	12.80	12.60	13.00
2	13.0	10.9	12.9	11.30	10.85	9.95	11.65	12.70	14.00	12.70	12.65	12.90
3	13.6	10.7	13.3	11.50	10.60	10.00	11.50	13.50	13.30	12.60	12.70	12.80
4	13.3	10.5	13.6	11.60	10.70	10.10	11.30	15.40	13.00	12.80	12.65	12.70
5	12.6	10.4	13.3	11.70	10.75	10.25	11.10	14.90	12.40	13.00	12.70	12.50
6	11.9	11.0	13.5	11.80	10.65	10.30	10.90	14.50	12.30	13.30	12.40	12.55
7	11.8	14.7	13.4	12.00	10.60	10.50	10.80	14.00	12.40	13.00	12.50	12.60
8	11.9	13.6	13.8	12.10	10.50	10.70	10.70	13.30	11.90	12.60	12.40	12.25
9	11.85	12.8	13.7	12.10	10.45	10.75	10.80	13.20	12.20	12.20	12.50	14.35
10	11.55	21.6	13.7	11.90	10.50	10.70	11.00	12.90	12.50	12.10	12.55	12.90
11	11.0	17.5	13.2	11.70	10.60	10.60	10.90	12.70	13.50	12.40	12.65	12.60
12	10.9	14.8	12.4	11.50	10.65	10.50	10.50	12.90	13.80	12.60	12.60	12.75
13	10.6	13.4	11.9	11.10	10.70	10.45	10.90	13.20	14.00	13.00	12.60	12.25
14	10.45	12.6	11.6	10.90	10.60	10.40	10.80	13.30	13.40	12.70	12.50	12.00
15	10.35	12.2	11.4	11.00	10.40	10.60	10.60	13.10	13.30	13.75	12.40	14.35
16	11.1	12.0	11.5	11.10	10.30	10.95	10.80	13.30	12.90	14.30	12.50	14.50
17	13.3	11.6	11.3	11.30	10.30	11.20	10.70	13.50	12.70	13.50	12.80	14.10
18	12.1	11.4	11.2	13.10	10.40	11.30	10.80	14.40	12.60	13.20	12.90	13.90
19	11.3	11.6	11.1	13.40	10.40	11.40	11.00	14.20	12.30	13.00	13.00	13.40
20	11.1	14.1	11.0	12.30	10.50	11.60	10.90	13.60	12.10	12.90	12.75	13.10
21	10.85	22.8	10.9	11.80	10.30	11.80	11.00	13.40	12.40	12.80	12.40	13.00
22	10.6	17.9	11.0	11.60	10.30	12.20	11.20	13.40	12.60	12.70	12.60	13.15
23	10.5	15.6	11.6	11.30	10.40	12.60	11.30	13.30	12.40	12.70	12.75	13.05
24	11.1	14.9	12.4	11.10	10.30	12.50	11.60	13.30	12.00	13.20	12.85	12.90
25	12.3	14.1	12.0	11.00	10.20	12.05	12.20	13.10	12.15	13.20	13.00	12.75
26	11.7	13.0	11.9	10.90	10.10	11.85	12.00	13.00	12.65	13.00	12.90	12.70
27	11.05	12.4	11.8	10.80	10.00	11.50	12.20	12.90	13.40	12.70	12.85	12.80
28	10.85	12.2	11.7	10.70	9.90	11.20	12.00	12.80	13.00	12.80	13.10	12.90
29	10.7	12.1	11.6	......	......	11.00	12.00	12.80	12.90	12.90	13.00	12.80
30	10.6	12.1	11.9	10.80	......	11.10	12.10	13.20	12.65	12.70	13.10	12.70
31	10.5	......	11.7	11.00	......	11.20	......	13.50	......	12.65	13.20	......

NOTE.—Gage heights affected by backwater from material excavated from power-house site beginning about June 21, 1911. Add 500 feet to reduce to sea level.

Daily discharge, in second-feet, of Nisqually River at La Grande, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	Sept.
1	1,100	642	1,790	1,370	910	514	1,240	1,930	3,320	682
2	2,360	910	2,280	1,170	878	502	1,400	2,140	3,160	642
3	2,840	785	2,600	1,300	730	514	1,300	2,760	2,600	606
4	2,600	682	2,840	1,370	785	542	1,170	4,280	2,360	572
5	2,070	642	2,600	1,440	815	589	1,040	3,880	1,930	514
6	1,580	975	2,760	1,510	758	606	910	3,560	1,860	528
7	1,510	3,720	2,680	1,650	730	682	845	3,160	1,930	541
8	1,580	2,840	3,000	1,720	682	785	785	2,600	1,580	457
9	1,540	2,210	2,920	1,720	662	815	845	2,520	1,790	1,540
10	1,340	9,470	2,920	1,580	682	785	975	2,280	2,000	642
11	975	5,980	2,520	1,440	730	730	910	2,140	2,760	541
12	910	3,800	1,930	1,300	758	682	682	2,280	3,000	589
13	730	2,680	1,580	1,040	785	662	910	2,520	3,160	457
14	662	2,070	1,370	910	730	642	845	2,600	2,680	402
15	624	1,790	1,240	975	642	730	730	2,440	2,600	1,540
16	1,040	1,650	1,300	1,040	606	942	845	2,600	2,280	1,650
17	2,600	1,370	1,170	1,170	606	1,100	785	2,760	2,140	1,370
18	1,720	1,240	1,100	2,440	642	1,170	845	3,480	2,070	1,240
19	1,170	1,370	1,040	2,680	642	1,240	975	3,320	1,860	910
20	1,040	3,240	975	1,860	682	1,370	910	2,840	1,720	730
21	878	10,500	910	1,510	606	1,510	975	2,680	....	682
22	730	6,320	975	1,370	606	1,790	1,100	2,680	....	758
23	682	4,440	1,370	1,170	642	2,070	1,170	2,600	....	706
24	1,040	3,880	1,930	1,040	606	2,000	1,370	2,600	....	642
25	1,860	3,240	1,650	975	572	1,680	1,790	2,440	....	589
26	1,440	2,360	1,580	910	542	1,540	1,650	2,360	....	572
27	1,010	1,930	1,510	845	514	1,300	1,790	2,280	....	606
28	878	1,790	1,440	785	490	1,100	1,650	2,210	....	642
29	785	1,720	1,370	815	....	975	1,650	2,210	....	606
30	730	1,720	1,580	845	....	1,040	1,720	2,520	....	572
31	682	....	1,440	975	....	1,100	....	2,760	....	....

NOTE.—Discharge Oct. 1, 1910, to June 20, 1911, determined from a fairly well defined rating curve. Discharge June 21 to Aug. 31, 1911, cannot be determined. Discharge Sept. 1 to 30, 1911, determined from a poorly defined rating curve.

Monthly discharge of Nisqually River at La Grande, Wash., for the year ending Sept. 30, 1911.

[Drainage area, 294 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	2,840	624	1,310	4.46	5.14	80,600	B.
November	10,500	642	2,870	9.76	10.89	171,000	B.
December	3,000	910	1,820	6.19	7.14	112,000	B.
January	2,680	785	1,320	4.49	5.18	81,200	B.
February	910	490	680	2.31	2.40	37,800	B.
March	2,070	502	1,020	3.47	4.00	62,700	B.
April	1,790	682	1,130	3.84	4.28	67,200	B.
May	4,280	1,930	2,690	9.15	10.55	165,000	B.
June 1-20	3,320	1,580	2,340	7.96	5.92	92,800	B.
September	1,650	402	751	2.55	2.84	44,700	C.

PUYALLUP RIVER BASIN.

PUYALLUP RIVER NEAR ELECTRON, WASH.

Location.—In sec. 3, T. 16 N., R. 6 E., just above the intake of the Puget Sound Power Co.'s flume, 12 miles above Electron.

Records available.—January 1, 1909, to September 30, 1911.

Drainage area.—91 square miles.

Gage.—Friez automatic gage, referred to a vertical staff.

Channel.—Gravel and bowlders; shifting.

Discharge measurements.—Made from a gaging bridge near the gage.

Accuracy.—Results fair.

Cooperation.—Field data furnished by Puget Sound Power Co.

Discharge measurements of Puyallup River near Electron, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 4	H. P. Gilkey	0.69	284
27	....do	0.67	286
July 8	....do	1.23	531
Sept. 8	G. L. Parker	1.09	306

Daily gage height, in feet, of Puyallup River near Electron, Wash., for the year ending Sept. 30, 1911.

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	1.90	1.40	1.10	0.73	0.51	0.24	0.91	0.61	2.0	1.30	1.60	1.65
2	1.45	1.35	1.40	.70	.44	.24	.84	.74	1.95	1.40	1.65	1.70
3	2.8	1.35	1.35	.79	.40	.21	.77	.88	1.60	1.60	1.65	1.60
4	2.7	1.20	1.30	.95	.40	.23	.71	.98	1.35	1.80	1.60	1.10
5	2.1	1.20	1.25	.93	.40	.26	.58	1.50	1.15	1.90	1.50	1.30
6	2.0	1.80	1.20	1.20	.39	.26	.54	1.15	1.10	2.0	1.45	1.45
7	2.3	2.8	1.30	1.30	.38	.38	.51	1.00	1.10	1.65	1.50	1.20
8	2.1	2.0	1.35	1.15	.38	.37	.49	1.05	1.10	1.35	1.35	1.20
9	2.1	2.1	1.15	1.10	.36	.37	.57	.98	1.15	1.25	1.35	1.60
10	1.80	4.6	1.05	.96	.37	.33	.59	.88	1.45	1.30	1.45	1.20
11	1.65	2.9	.94	.89	.38	.31	.50	.84	2.3	1.35	1.45	1.10
12	1.55	2.2	.88	.79	.38	.27	.44	.87	2.6	1.50	1.45	1.30
13	1.40	1.80	.83	.66	.37	.25	.41	.98	2.5	1.70	1.40	1.30
14	1.40	1.60	.78	.65	.36	.25	.40	.93	2.2	2.0	1.40	1.20
15	1.50	1.40	.75	.65	.35	.31	.41	.95	1.90	2.4	1.30	1.70
16	1.40	1.30	.81	.60	.28	.48	.49	1.05	1.80	2.5	1.35	1.65
17	2.1	1.25	.75	.63	.31	.52	.43	1.05	1.70	2.15	1.50	1.85
18	1.65	1.25	.68	.98	.35	.53	.62	1.25	1.55	2.00	1.50	1.40
19	1.50	1.25	.63	.99	.29	.55	.52	1.15	1.45	1.85	1.40	1.20
20	1.40	1.85	.63	.80	.27	.74	.49	1.05	1.40	1.75	1.20	1.15
21	1.35	3.6	.59	.72	.28	.82	.56	1.10	1.50	1.65	1.20	1.20
22	1.30	2.5	.77	.64	.27	.85	.59	1.15	1.60	1.65	1.30	1.15
23	1.15	2.2	1.45	.62	.26	1.15	.59	1.00	1.45	1.65	1.40	1.05
24	2.1	1.70	1.35	.60	.27	1.10	.83	1.05	1.20	1.95	1.50	.96
25	2.6	1.45	1.15	.56	.26	.92	.99	.98	1.25	2.05	1.45	.95
26	1.95	1.25	1.05	.52	.25	.79	.86	.92	1.90	1.85	1.50	.97
27	1.70	1.15	.92	.49	.24	.70	.77	.90	2.0	1.65	1.50	.93
28	1.55	1.00	.90	.46	.24	.58	.62	.92	1.85	1.70	1.45	.86
29	1.40	.97	.87	.40	....	.59	.60	1.10	1.60	1.80	1.45	.84
30	1.35	1.15	.89	.64	....	.71	.61	1.45	1.30	1.75	1.65	.82
31	1.25	....	.80	.59	....	.80	....	1.90	....	1.65	1.70	....

Daily discharge, in second-feet, of Puyallup River near Electron, Wash., for the years ending Sept. 30, 1909–1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1909.									
1	212	235	255	275	255	1,300	550	495	495
2	310	275	235	235	295	1,390	610	468	580
3	405	295	255	215	440	1,060	645	522	550
4	355	255	255	212	495	900	610	468	580
5	290	235	235	212	415	750	580	390	580
6	250	235	215	205	340	645	550	390	550
7	230	215	208	190	318	645	580	390	468
8	195	205	215	190	295	610	610	440	390
9	212	201	212	212	295	715	610	495	390
10	195	194	198	212	295	900	610	468	365
11	180	180	190	208	318	980	715	440	255
12	180	173	190	208	295	820	550	440	275
13	195	177	190	212	295	645	495	440	318
14	165	180	190	205	295	680	522	468	318
15	270	208	187	201	295	820	580	390	340
16	250	468	198	194	318	750	522	390	440
17	760	495	212	184	340	750	440	468	295
18	570	495	201	180	340	645	390	550	255
19	1,410	390	198	176	318	610	390	610	215
20	1,390	340	190	176	318	580	440	495	365
21	1,140	295	180	166	295	550	495	390	255
22	750	275	173	166	275	522	610	365	215
23	550	275	170	169	275	550	610	318	235
24	440	295	173	166	295	522	610	318	295
25	390	275	173	212	340	522	550	415	318
26	340	255	180	318	495	750	468	820	255
27	318	275	198	365	750	610	440	440	296
28	275	235	198	318	680	495	440	390	365
29	255	....	208	275	550	495	522	468	340
30	255	....	201	255	522	522	522	415	235
31	235	....	275	....	715	....	550	440	....

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1909–10.												
1	187	235	860	175	310	1,630	290	350	620	310	465	300
2	173	1,660	620	152	290	1,830	290	330	445	290	465	292
3	176	1,890	455	202	272	1,100	272	330	370	290	490	365
4	180	920	405	193	252	780	272	330	395	310	490	340
5	285	700	380	220	245	620	310	330	445	330	490	320
6	365	570	330	238	238	500	330	395	420	380	540	276
7	255	350	310	146	224	420	310	560	370	430	570	218
8	235	375	290	138	213	370	350	620	330	560	630	194
9	365	328	310	135	210	330	370	680	370	590	695	172
10	340	305	272	132	200	330	395	940	530	720	570	172
11	340	265	430	130	194	395	445	940	1,180	720	540	154
12	295	249	1,190	127	197	530	445	710	685	765	515	166
13	318	237	720	127	255	680	420	560	455	660	465	178
14	235	208	530	127	217	860	370	500	380	600	415	197
15	235	190	430	125	204	860	350	420	380	695	320	226
16	215	181	380	122	182	780	330	395	380	730	300	264
17	190	285	330	120	187	860	330	445	330	695	365	246
18	201	1,790	310	202	179	860	420	500	290	570	440	246
19	212	1,990	290	140	174	1,100	590	445	430	600	540	256
20	215	1,160	255	127	171	940	680	370	355	660	540	320
21	212	665	238	205	171	780	590	395	310	800	440	465
22	170	2,190	220	405	168	710	500	500	272	630	390	540
23	208	2,490	217	860	234	620	650	650	272	570	340	465
24	235	1,890	211	860	420	500	940	780	290	570	300	340
25	180	1,080	214	560	395	420	1,100	745	355	515	320	296
26	156	665	196	420	330	395	940	650	405	540	340	256
27	145	510	187	395	445	350	680	530	355	515	340	253
28	162	1,080	184	350	445	350	530	420	330	570	320	288
29	166	2,490	178	310	....	310	445	560	330	540	300	570
30	136	1,370	272	395	....	290	370	530	310	515	284	515
31	198	....	208	350	....	290	....	620	....	515	340	....

Daily discharge, in second-feet, of Puyallup River near Electron, Wash., for the year ending Sept. 30, 1909–1911—Continued.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1910–11.												
1	800	380	468	297	216	138	373	251	1,080	580	560	590
2	515	355	640	285	193	138	342	301	1,040	640	590	620
3	1,550	355	610	321	180	130	313	359	770	770	590	560
4	1,280	290	580	392	180	135	289	406	610	920	560	310
5	790	290	551	382	180	142	240	705	495	1,000	505	400
6	720	590	522	522	177	142	226	495	468	1,080	478	478
7	940	1,370	580	580	174	174	216	416	468	805	505	350
8	790	720	610	495	174	172	209	442	468	610	425	350
9	790	790	495	468	169	172	236	406	495	551	425	560
10	590	3,200	442	397	172	160	244	359	672	580	478	350
11	505	1,890	387	364	174	155	212	342	1,320	610	478	310
12	455	1,240	359	321	174	145	193	355	1,590	705	478	400
13	380	920	338	270	172	140	183	406	1,500	840	450	400
14	380	770	317	266	169	140	180	382	1,240	1,080	450	350
15	430	640	305	266	166	155	183	392	1,000	1,410	400	620
16	380	580	329	247	147	206	209	442	920	1,210	425	590
17	790	551	305	258	155	219	190	442	840	930	505	715
18	505	551	277	406	166	222	255	551	738	820	505	450
19	430	551	258	411	150	230	219	495	672	715	450	350
20	380	960	258	325	145	301	209	442	640	650	350	330
21	355	2,590	244	293	147	334	233	468	705	590	350	350
22	330	1,500	313	262	145	346	244	495	770	590	400	330
23	270	1,240	672	255	142	495	244	416	672	590	450	290
24	790	840	610	247	145	468	338	442	522	785	505	255
25	1,190	672	495	233	142	378	411	406	551	855	478	251
26	685	551	442	219	140	321	351	378	1,000	715	505	259
27	530	495	378	209	138	285	313	368	1,080	590	505	243
28	455	416	368	198	138	240	255	378	960	620	478	218
29	380	402	355	180	....	244	247	468	770	680	478	212
30	355	495	364	262	....	289	251	672	580	650	590	205
31	310	....	325	244	....	325	....	1,000	....	590	620	....

NOTE.—Discharge determined as follows: Jan. 1, 1909, to Nov. 10, 1910, from gage heights and measurements made by employees of the Puget Sound Power Co. and by studies of the output of electrical energy; Nov. 11, 1910 to July 15, 1911, from a rating curve fairly well defined between 180 and 1,500 second-feet; July 16 to Sept. 30, 1911, from a well-defined rating curve.

Monthly discharge of Puyallup River near Electron, Wash., for 1909–1911.

[Drainage area, 91 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
1909.							
January	1,410	165	418	4.59	5.29	25,700	C.
February	495	173	273	3.00	3.12	15,200	C.
March	275	170	205	2.25	2.59	12,600	C.
April	365	166	217	2.38	2.66	12,900	C.
May	750	255	380	4.18	4.82	23,400	B.
June	1,390	495	724	7.96	8.88	43,100	B.
July	715	390	542	5.96	6.87	33,300	B.
August	820	318	451	4.96	5.72	27,700	B.
September	580	215	361	3.97	4.43	21,500	B.
The period	....	....	....	....	....	215,000	

Monthly discharge of Puyallup River near Electron, Wash., for 1909–1911—**Continued.**

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
1909-1910.							
October	365	136	224	2.46	2.84	13,800	C.
November	2,490	181	944	10.4	11.60	56,200	C.
December	1,190	178	368	4.04	4.66	22,600	C.
January	860	120	264	2.90	3.34	16,200	C.
February	445	168	251	2.76	2.87	13.900	C.
March	1,830	290	671	7.37	8.50	41,300	B.
April	1,100	272	477	5.24	5.85	28,400	B.
May	940	330	533	5.86	6.76	32,800	B.
June	1,180	272	413	4.54	5.06	24,600	B.
July	800	290	554	6.09	7.02	34,100	C.
August	695	284	437	4.80	5.53	26,900	C.
September	570	154	296	3.25	3.63	17,600	C.
The year	2,490	120	453	4.98	67.66	328,000	
1910-11.							
October	1,550	270	615	6.76	7.79	37,800	B.
November	3,200	290	873	9.59	10.70	51,900	C.
December	672	244	426	4.68	5.40	26,200	C.
January	580	180	319	3.51	4.05	19,600	B.
February	216	138	163	1.79	1.86	9,050	B.
March	495	130	230	2.53	2.92	14,100	B.
April	411	180	254	2.79	3.11	15,100	A.
May	1,000	251	448	4.92	5.67	27,500	A.
June	1,590	468	821	9.02	10.06	48,900	A.
July	1,410	551	766	8.42	9.71	47,100	B.
August	620	350	483	5.31	6.12	29,700	A.
September	715	205	390	4.29	4.79	23,200	A.
The year	3,200	130	484	5.32	72.18	350,000	

CARBON RIVER AT FAIRFAX, WASH.

Location.—In sec. 26, T. 18 N., R. 6 E., at the Northern Pacific Railway bridge at Fairfax.

Records available.—November 23, 1910, to September 30, 1911.

Drainage area.—79 square miles.

Gage.—Vertical staff attached to a wing dam just above the bridge.

Channel.—Gravel; shifting in extreme floods.

Discharge measurements.—Made from the railway bridge.

Accuracy.—Results good.

Cooperation.—Gage-height record furnished by officers of Mount Rainier National Park.

Discharge measurements of Carbon River at Fairfax, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Nov. 23	H. P. Gilkey	6.60	1,100	Feb. 25	H. P. Gilkey	5.02	98.6
				25	.....do	5.01	102
1911.				July 3	.....do	6.55	788
Jan. 31	H. P. Gilkey	5.40	194	19	W. W. Clifford	6.11	513
31	.....do	5.38	174	Sept. 3	R. C. Pierce	5.62	271

Daily gage height, in feet, of Carbon River at Fairfax, Wash., for the year ending Sept. 30, 1911.

[T. E. O'Farrell, observer.]

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1			5.7	5.4	5.0	5.6			6.4		
2		6.0		5.3	5.0	5.6	5.6	6.5	6.5		
3		6.0		5.3	5.0	5.6	5.7				5.7
4		6.1	5.7	5.3	5.1	5.5	5.9		6.3		
5			5.9	5.2	5.2	5.5			6.4		
6		6.0	5.9	5.2	5.2	5.4			6.6		
7		6.1	6.0	5.1	5.2	5.4			6.3		
8		6.2	5.9	5.2	5.1	5.4	5.5				
9		6.0		5.2	5.1	5.4			5.9		
10				5.2							
11				5.1		5.4	5.7		5.9		
12				5.1	5.0		5.7		6.5		
13			5.5	5.1	5.1	5.3	5.9				
14		5.6	5.4	5.2	5.1				6.4		
15		5.8	5.4	5.1	5.1	5.3	5.9				
16			5.5	5.1	5.0	5.3	5.8				
17			5.5	5.1	5.0	5.3	5.9		6.2		
18				5.1	5.2	5.3	5.9				
19			5.5	5.1	5.3	5.4			6.1		
20			5.6	5.1		5.4	5.8				
21			5.6	5.1	5.7	5.4			5.9		
22		5.6	5.6	5.0	5.9	5.5					
23	6.6	5.6	5.5	5.0	5.9		5.8		5.9		
24	6.4	5.8	5.5	5.0	5.9				6.0		
25	6.2	6.0	5.4	5.0	5.8	5.6		6.1	5.9		5.4
26			5.4	4.9	5.8	5.5	5.7	6.1			5.4
27	5.9		5.4	4.9	5.7	5.5	5.7	6.3	6.2		5.3
28	5.7	5.8	5.3	5.0	5.6	5.5		6.2			
29		5.7	5.3		5.5		5.9		6.2		
30	5.8	5.7	5.4		5.6	5.5					5.3
31		5.7	5.4		5.6		6.5				

Daily discharge, in second-feet, of Carbon River at Fairfax, Wash., for the year ending Sept. 30, 1911.

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1		420	305	185	98	260	240	820	695	510	460
2		490	305	155	98	260	260	755	755	510	400
3		490	305	155	98	260	305	540	695	510	305
4		570	305	155	114	220	405	500	635	490	280
5		530	405	132	132	220	358	460	695	450	290
6		490	405	132	132	185	312	440	820	430	330
7		570	460	114	132	185	266	440	635	430	310
8		650	405	132	114	185	220	450	520	400	310
9		490	368	132	114	185	248	480	405	370	360
10		443	331	132	109	185	276	530	405	370	300
11		396	294	114	103	185	305	640	405	400	280
12		349	257	114	98	170	305	1,100	755	420	280
13		302	220	114	114	155	405	1,050	725	400	320
14		255	185	132	114	155	405	920	695	370	300
15		360	185	114	114	155	405	860	655	340	300
16		345	220	114	98	155	355	770	615	350	460
17		330	220	114	98	155	405	670	575	390	440
18		315	220	114	132	155	405	620	545	360	340
19		300	220	114	155	185	380	580	515	310	310
20		285	260	114	230	185	355	570	460	280	300
21		270	260	114	305	185	355	580	405	280	280
22		255	260	98	405	220	355	570	405	310	260
23	1,100	255	220	98	405	235	355	520	405	350	210
24	840	360	220	98	405	250	340	480	460	420	200
25	650	490	185	98	355	260	320	515	405	410	185
26	540	450	185	85	355	220	305	515	490	400	185
27	420	410	185	85	305	220	305	635	575	400	155
28	305	360	155	98	260	220	355	575	575	410	155
29	332	305	155		220	220	405	615	575	430	155
30	360	305	185		260	220	580	655	560	430	155
31		305	185		260		755		530	470	

NOTE.—Discharge Nov. 23 to Dec. 31, 1910, determined from a fairly well-defined rating curve. Discharge Jan. 1 to Sept. 30, 1911, determined from a rating curve well defined between 100 and 1,000 second-feet. Discharge June 3 to 24, July 30 to Sept. 2, and Sept. 4 to 24, 1911, estimated by comparison with the records of Puyallup River near Election. Discharge interpolated for all other days when no gage height was reported.

Monthly discharge of Carbon River at Fairfax, Wash., for the year ending Sept. 30, 1911.

[Drainage area, 79 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
November 23-30	1,100	305	568	7.19	2.14	9,010	B.
December	650	255	392	4.96	5.72	24,100	B.
January	460	155	260	3.29	3.79	16,000	A.
February	185	85	120	1.52	1.58	6,660	A.
March	405	98	191	2.42	2.79	11,700	A.
April	260	155	202	2.56	2.86	12,000	A.
May	755	220	356	4.51	5.20	21,900	A.
June	1,100	440	628	7.95	8.87	37,400	C.
July	820	405	567	7.18	8.28	34,900	B.
August	510	280	400	5.06	5.83	24,600	C.
September	460	155	287	3.63	4.05	17,100	C.
The period						215,000	

DUWAMISH RIVER BASIN.

WHITE RIVER AT BUCKLEY, WASH.

Location.—In sec. 34, T. 20 N., R. 6 E., at the Northern Pacific Railway bridge about three-fourths of a miles northeast of Buckley.

Records available.—April 22, 1899, to August 31, 1903; October 1, 1910, to September 30, 1911.

Drainage area.—424 square miles.

Gage.—Inclined staff. There is an auxiliary gage near Mud Mountain.

Channel.—Sand and gravel; shifting.

Discharge measurements.—Made from the bridge at the gage.

Accuracy.—Results good.

Cooperation.—Records at Mud Mountain furnished by P. H. Hebb, Tacoma, Wash.

NOTE.—Tables showing monthly discharge for 1899 to 1901 and for 1910 were published in Water-Supply Paper 313. Base data for these records are not published.

Discharge measurements of White River at Buckley, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.		Discharge.
		Buckley gage.	Mud Mountain gage.	
1910.		*Feet.*	*Feet.*	*Sec.-ft.*
Oct. 2	F. F. Henshaw	0.87		963
Nov. 22	H. P. Gilkey	2.55		5,250
1911.				
Jan. 30	H. P. Gilkey	.55		901
Feb. 24	.....do	.22		588
Apr. 6	.....do	.74		1,030
6	.....do	.71		1,030
30	.....do	.93		1,180
July 6	.....do	1.53	3.17	2,230
19	W. W. Clifford	1.18	2.87	1,660
Aug. 25[a]		.45	2.30	640
Sept. 4	R. C. Pierce	.50	2.40	683
25	G. L. Parker		2.20	511

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[a] Discharge determined from an unaffected gage reading at Buckley. Gage height is observer's reading for day.

Daily gage height, in feet, of White River at Buckley, Wash., for the year ending Sept. 30, 1911.

[H. P. Anderson, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July,	Aug.	Sept.
1	1.3	0.9	1.1	0.95	0.65	0.10	1.05	1.00	1.90	1.20	......	......
2	1.0	.8	1.2	.85	.55	.10	1.05	1.10	2.1	1.20	......	......
3	2.3	.95	1.3	.85	.50	.10	.95	1.10	1.85	1.40	......	......
4	2.15	.9	1.25	1.00	.50	.15	.85	1.30	1.55	1.35	......	0.50
5	1.9	.8	1.25	1.00	.45	.15	.80	1.45	1.45	1.30	......	.45
6	1.3	1.05	1.3	1.20	.40	.20	.70	1.35	1.40	1.55	......	.45
7	1.8	1.5	1.45	1.50	.40	.45	.70	1.30	1.45	1.50	......	.4
8	1.5	1.5	1.5	1.50	.35	.45	.70	1.30	1.35	1.30	......	......
9	1.6	1.5	1.4	1.40	.35	.45	.70	1.20	1.40	1.15	......	.5
10	1.45	3.45	1.3	1.20	.35	.40	.75	1.15	1.50	1.10	......	......
11	1.3	2.75	1.25	1.05	.45	.35	.70	1.05	2.0	1.05	......	......
12	1.2	2.1	1.0	.95	.40	.35	.65	1.15	2.2	1.15	......	......
13	1.0	1.7	1.0	.90	.35	.30	.60	1.35	2.2	1.20	......	......
14	1.0	1.5	.95	.80	.35	.25	.50	1.35	2.1	1.30	......	......
15	.9	1.35	.95	.75	.30	.40	.50	1.30	2.0	1.25	......	......
16	.9	1.1	.90	.75	.20	.65	.45	1.35	1.90	1.30	......	......
17	1.2	1.0	.80	.80	.20	.80	.50	1.35	1.75	1.40	......	......
18	1.2	1.0	.75	1.00	.25	.80	.70	1.50	1.60	1.20	......	......
19	1.05	.95	.75	1.00	.25	.80	.75	1.70	1.50	1.10	......	......
20	.9	1.45	.7	.90	.20	1.05	.75	1.50	1.50	......	......	......
21	.8	3.15	.7	.80	.20	1.00	.85	1.45	1.40	......	......	......
22	.8	2.5	.7	.70	.20	1.10	.85	1.45	1.50	......	......	......
23	.8	2.2	1.05	.65	.20	1.45	.90	1.35	1.40	......	......	......
24	.9	1.9	1.3	.65	.20	1.40	1.05	1.30	1.25	......	......	......
25	1.95	1.7	1.2	.60	.20	1.15	1.35	1.15	1.20	......	0.45	......
26	1.6	1.5	1.05	.50	.20	1.00	1.20	1.15	1.50	......	......	......
27	1.1	1.3	1.1	.50	.15	.90	1.10	1.15	1.60	......	......	......
28	1.0	1.2	1.0	.50	.10	.80	1.00	1.10	1.50	......	......	......
29	.9	1.2	1.0	.50	......	.75	.95	1.20	1.40	......	......	......
30	1.0	1.3	1.1	.50	......	.85	.95	1.35	1.25	......	......	......
31	.9	......	1.05	.65	......	1.00	......	1.65	......	......	......	......

NOTE.—Gage heights July 20 to Aug. 24, Aug. 26 to Sept. 3, Sept. 8 and 10 to 30, '911, affected by construction work and not published.

Daily gage height, in feet, of White River near Mud Mountain, above Buckley, Wash., for the year ending Sept. 30, 1911.

[W. Knox, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.75	2.22	2.80	2.80	2.45	2.30	2.90	2.82	3.85	3.00	2.55	2.40
2	3.15	2.30	2.85	2.70	2.42	2.30	2.85	2.85	3.85	3.05	2.50	2.40
3	3.63	2.27	2.85	2.60	2.35	2.30	2.80	2.95	3.65	3.07	2.50	2.40
4	3.67	2.17	2.90	2.70	2.35	2.30	2.75	3.07	3.50	3.10	2.50	2.40
5	2.73	2.22	2.92	2.85	2.40	2.30	2.67	3.20	3.37	3.12	2.50	2.35
6	2.75	2.37	3.15	2.90	2.32	2.30	2.65	3.10	3.27	3.17	2.50	2.30
7	2.80	2.52	3.30	3.20	2.37	2.30	2.65	3.10	3.15	3.15	2.50	2.30
8	2.75	2.64	3.25	3.27	2.35	2.30	2.62	3.07	3.12	3.02	2.50	2.30
9	2.70	3.13	3.20	3.12	2.35	2 30	2.55	3.07	3.17	2.90	2.50	2.30
10	2.66	5.90	3.07	3.00	2.35	2.30	2.60	3.00	3.35	2.80	2.50	2.30
11	2.60	5.20	2.95	2.85	2.30	2.32	2.57	2.97	3.42	2.77	2.45	2.30
12	2.50	4.20	2.87	2.77	2.30	2.30	2.50	3.07	3.50	2.80	2.45	2.30
13	2.45	3.50	2.80	2.67	2.30	2.35	2.47	3.12	3.60	2.90	2.40	2.30
14	2.45	3.15	2.72	2.62	2.30	2.42	2.40	3.10	3.80	2.95	2.35	2.32
15	2.40	2.90	2.70	2.52	2.30	2.45	2.40	3.05	3.85	3.00	2.35	2.50
16	2.45	2.65	2.70	2.47	2.30	2.50	2.40	3.10	3.70	3.05	2.30	2.70
17	2.43	2.60	2.67	2.65	2.30	2.62	2.42	3.22	3.52	3.02	2.30	2.60
18	2.44	2.60	2.60	2.90	2.30	2.65	2.50	3.30	3.37	2.90	2.30	2.45
19	2.40	2.55	2.57	2.75	2.35	2.70	2.57	3.45	3.25	2.87	2.30	2.35
20	2.40	3.40	2.55	2.67	2.35	2.85	2.62	3.30	3.20	2.80	2.30	2.30
21	2.20	6.00	2.57	2.60	2.35	2.90	2.70	3.20	3.10	2.75	2.30	2.27
22	2.22	4.90	2.72	2.55	2.35	2.92	2.70	3.20	3.10	2.77	2.30	2.20
23	2.32	4.35	2.87	2.50	2.30	3.10	2.77	3.10	3.05	2.65	2.30	2.20
24	2.40	4.42	2.95	2.52	2.30	3.10	2.90	3.10	3.00	2.67	2.30	2.20
25	2.47	4.45	2.90	2.50	2.30	3.00	3.10	3.00	2.97	2.75	2.30	2.20
26	2.65.	4.20	2.87	2.45	2.30	2.82	2.97	2.97	3.10	2.70	2.30	2.20
27	2.50	3.45	2.85	2.40	2.30	2.72	2.87	2.90	3.25	2.70	2.30	2.15
28	2.42	2.90	2.85	2.42	2.30	2.65	2.80	2.92	3.10	2.65	2.32	2.10
29	2.32	2.70	2.80	2.42	......	2.65	2.75	2.97	3.05	2.65	2.35	2.07
30	2.25	2.80	2.85	2.42	......	2.72	2.77	3.20	3.00	2.62	2.37	2.00
31	2.20	......	2.80	2.45	......	2.82	......	3.52	......	2.57	2.40	......

Daily discharge, in second-feet, of White River at Buckley, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1,580	1,000	1,730	1,470	1,020	460	1,520	1,330	3,060	1,650	925	700
2	1,130	870	1,910	1,300	905	460	1,520	1,490	3,530	1,650	830	700
3	3,700	1,060	2,100	1,300	850	460	1,360	1,490	2,950	2,020	830	700
4	3,440	1,000	2,000	1,550	850	505	1,200	1,830	2,320	1,920	830	700
5	2,740	870	2,000	1,550	800	505	1,130	2,120	2,120	1,830	830	650
6	1,580	1,200	2,100	1,910	750	550	1,000	1,920	2,020	2,320	830	600
7	2,530	1,930	2,400	2,500	750	800	1,000	1,830	2,120	2,220	830	600
8	1,930	1,930	2,500	2,500	700	800	1,000	1,830	1,920	1,830	830	600
9	2,120	1,930	2,300	2,300	700	800	1,000	1,650	2,020	1,570	830	600
10	1,840	8,700	2,100	1,910	700	750	1,060	1,570	2,220	1,490	830	600
11	1,580	6,000	2,000	1,640	800	700	1,000	1,410	3,280	1,410	765	600
12	1,420	3,900	1,550	1,470	750	700	935	1,570	3,800	1,570	765	600
13	1,130	2,920	1,550	1,390	700	650	870	1,920	3,800	1,650	700	600
14	1,130	2,500	1,470	1,230	700	600	750	1,920	3,530	1,830	650	620
15	1,000	2,200	1,470	1,160	650	750	750	1,830	3,280	1,740	650	830
16	1,000	1,730	1,390	1,160	550	1,020	700	1,920	3,060	1,830	600	1,210
17	1,420	1,550	1,230	1,230	550	1,230	750	1,920	2,740	2,020	600	1,020
18	1,420	1,550	1,160	1,550	600	1,230	1,000	2,220	2,420	1,650	600	765
19	1,200	1,470	1,160	1,550	600	1,230	1,060	2,630	2,220	1,490	600	650
20	1,000	2,400	1,090	1,390	550	1,640	1,060	2,220	2,220	1,400	600	600
21	870	7,500	1,090	1,230	550	1,550	1,200	2,120	2,020	1,300	600	579
22	870	5,100	1,090	1,090	550	1,730	1,200	2,120	2,220	1,340	600	530
23	870	4,180	1,640	1,020	550	2,260	1,280	1,920	2,020	1,120	600	530
24	1,000	3,390	2,100	1,020	550	2,160	1,520	1,830	1,740	1,150	600	530
25	2,860	2,920	1,910	960	550	1,700	1,920	1,570	1,650	1,300	600	530
26	2,120	2,500	1,640	850	550	1,440	1,650	1,570	2,220	1,210	600	530
27	1,270	2,100	1,730	850	505	1,280	1,490	1,570	2,420	1,210	600	500
28	1,130	1,910	1,550	850	460	1,130	1,330	1,490	2,220	1,120	620	470
29	1,000	1,910	1,550	850	....	1,060	1,250	1,650	2,020	1,120	650	456
30	1,130	2,100	1,730	850	....	1,200	1,250	1,920	1,740	1,060	670	425
31	1,000	....	1,640	1,020	....	1,440	....	2,520	....	963	700	....

NOTE.—Discharge Oct. 1, 1910, to July 19, 1911, determined from several well-defined rating curves applied to the readings of the gage at Buckley. Discharge July 20 to Sept. 30, 1911, determined from a well-defined rating curve applied to the readings of the Mud Mountain gage.

Monthly discharge of White River at Buckley, Wash., for the year ending Sept. 30, 1911.

[Drainage area, 424 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	3,700	870	1,580	3.73	4.30	97,200	B.
November	8,700	870	2,680	6.32	7.05	159,000	B.
December	2,500	1,090	1,710	4.03	4.65	105,000	A.
January	2,500	850	1,380	3.25	3.75	84,800	A.
February	1,020	460	669	1.58	1.64	37,200	A.
March	2,260	460	1,060	2.50	2.88	65,200	A.
April	1,920	700	1,160	2.74	3.06	69,000	A.
May	2,630	1,330	1,840	4.34	5.00	113,000	A.
June	3,800	1,650	2,500	5.90	6.58	149,000	A.
July	2,320	963	1,550	3.66	4.22	95,300	A.
August	925	600	702	1.66	1.91	43,200	B.
September	1,210	425	634	1.50	1.67	37,700	B.
The year	8,700	425	1,460	3.44	46.71	1,060,000	

GREEN RIVER AT KANASKAT, WASH.

Location.—In sec. 10, T. 21 S., R. 7 E., at the highway bridge at Kanaskat.

Records available.—May 1 to October 31, 1911.

Drainage area.—235 square miles.

Gage.—Vertical staff on left bank.

Channel.—Rocky; practically permanent.

Discharge measurements.—Made from the highway bridge, 25 feet above the gage, or by wading.

Accuracy.—Results good.

Discharge measurements of Green River at Kanaskat, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 17	H. P. Gilkey	4.18	918	July 7	W. W. Clifford	3.33	509
29	....do	4.56	1,210	Aug. 28	G. L. Parker	2.13	144
June 23	....do	3.68	665				

Daily gage height, in feet, and discharge, in second-feet, of Green River at Kanaskat, Wash., for 1911.

[J. L. O'Connor, observer.]

Day.	May.		June.		July.		August.		September.		October.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	4.6	1,220	5.8	2,240	3.6	625	2.6	249	2.05	132	2.8	308
2	4.8	1,360	5.6	2,040	3.6	625	2.55	236	2.05	132	2.8	308
3	4.9	1,440	5.4	1,860	3.55	602	2.5	222	2.2	158	2.8	308
4	5.1	1,600	5.0	1,520	3.5	580	2.5	222	2.3	178	2.8	308
5	5.4	1,860	4.9	1,440	3.5	580	2.45	210	2.4	199	2.7	278
6	5.2	1,680	4.7	1,290	3.45	558	2.45	210	2.4	199	2.7	278
7	5.2	1,680	4.6	1,220	3.35	514	2.45	210	2.5	222	2.7	278
8	5.2	1,680	4.3	1,020	3.4	535	2.45	210	2.6	249	2.7	278
9	5.1	1,600	4.4	1,080	3.35	514	2.45	210	2.7	278	2.7	278
10	5.0	1,520	4.5	1,150	3.45	558	2.45	210	2.7	278	2.8	308
11	4.9	1,440	4.6	1,220	3.3	492	2.45	210	2.7	278	2.8	308
12	4.8	1,360	4.6	1,220	3.2	451	2.45	210	2.9	340	2.8	308
13	4.9	1,440	4.6	1,220	3.15	432	2.45	210	3.2	451	2.8	308
14	5.0	1,520	4.6	1,220	3.0	375	2.4	199	3.8	725	2.8	308
15	4.9	1,440	4.5	1,150	3.0	375	2.4	199	4.0	835	2.8	308
16	4.9	1,440	4.5	1,150	2.85	324	2.35	188	4.8	1,360	2.75	293
17	5.3	1,770	4.4	1,080	2.8	308	2.3	178	4.5	1,150	2.75	293
18	5.9	2,340	4.2	955	2.8	308	2.35	188	4.1	895	2.7	278
19	6.5	3,000	4.0	835	2.75	293	2.35	188	4.0	835	2.7	278
20	6.0	2,450	4.0	835	2.75	293	2.3	178	4.0	835	2.65	264
21	5.9	2,340	4.0	835	2.75	293	2.3	178	3.9	780	2.6	249
22	5.9	2,340	3.9	780	2.7	278	2.25	168	3.85	752	2.6	249
23	5.8	2,240	3.9	780	2.7	278	2.25	168	3.8	725	2.6	249
24	5.4	1,860	3.85	752	2.7	278	2.2	158	3.65	650	2.6	249
25	5.0	1,520	3.7	675	2.7	278	2.2	158	3.55	602	2.6	249
26	5.0	1,520	3.6	625	2.7	278	2.1	140	3.3	492	2.6	249
27	4.9	1,440	3.6	625	2.7	278	2.05	132	3.1	412	2.6	249
28	4.9	1,440	3.6	625	2.7	278	2.05	132	3.0	375	2.6	249
29	5.2	1,680	3.6	625	2.65	264	2.05	132	3.0	375	2.6	249
30	5.4	1,860	3.6	625	2.6	249	2.05	132	3.0	375	2.5	222
31	5.7	2,140	......	......	2.6	249	2.05	132	......	......	2.5	222

NOTE.—Discharge determined from a rating curve well defined below 1,500 second-feet.

Monthly discharge of Green River at Kanaskat, Wash., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
May	3,000	1,220	1,750	108,000	B.
June	2,240	625	1,090	64,900	A.
July	625	249	398	24,500	A.
August	249	132	186	11,400	A.
September	1,360	132	509	30,300	A.
October	308	222	276	17,000	A.
The period				256,000	

CEDAR RIVER NEAR RAVENSDALE,[1] WASH.

Location.—In sec. 19, T. 22 N., R. 7 E., at the diversion dam of the Seattle water supply, 3 miles north of Ravensdale and about 15 miles below Cedar Lake.

Records available.—March 24, 1901, to September 30, 1911.

Drainage area.—149 square miles.

Gage.—Vertical staff.

Channel.—The control is the steel-shod crest of a timber dam, practically permanent.

Discharge measurements.—Made from a cable 600 feet above the dam. Low-water measurements made from a cable just below the dam prior to November, 1906.

Diversion.—Water is diverted above the dam for water supply of Seattle. The amount diverted is considered in making estimates so that values represent approximately the natural flow.

Cooperation.—Gage-height record furnished by the city of Seattle.

Accuracy.—Results fair.

Discharge measurements of Cedar River near Ravensdale, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 2	H. P. Gilkey	0.69	288
Aug. 26	G. L. Parker	.51	237
27	....do	.61	254

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[1] Tables showing monthly discharge in Cedar River Basin were published in Water-Supply Paper 313, as follows:

Cedar River at Clifford bridge near Ravensdale, Wash., 1895–1898; Cedar River at Vaughn bridge, near North Bend, Wash., 1898–99; Cedar River, at Cedar Lake, near North Bend, Wash., 1902-3; Cedar River at Renton, Wash., 1901–1903 and 1906–7; Cedar River near Ravensdale, Wash., 1901–1912. No base data published prior to Oct. 1, 1910.

Daily gage height, in feet, of Cedar River near Ravensdale, Wash., for the year ending Sept. 30, 1911.

[George Lansburg, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.80	0.92	1.40	1.40	1.00	0.91	0.79	1.25	1.70	0.78	0.60	0.56
2	.69	.91	1.35	1.25	1.10	.91	.71	1.25	1.75	.79	.58	.54
3	1.00	.88	1.35	1.25	1.10	.94	.72	1.25	1.60	.79	.55	.57
4	.95	.92	1.40	1.20	1.10	.94	.76	1.40	1.60	.79	.60	.58
5	.91	.91	1.50	1.20	1.10	.98	.78	1.65	1.50	.80	.63	.54
6	.84	1.20	1.70	1.15	1.10	.97	.79	1.65	1.35	.81	.58	.60
7	1.30	1.50	1.70	1.45	1.10	.95	.78	1.60	1.25	.82	.54	.59
8	.98	1.90	1.65	1.90	1.05	.95	.75	1.60	1.15	.82	.52	.58
9	.94	1.85	1.70	1.75	1.00	.94	.75	1.60	1.10	.79	.71	.61
10	.92	2.8	1.60	1.75	1.00	.92	.74	1.60	1.20	.78	.60	.62
11	.88	3.8	1.55	1.65	1.00	.90	.78	1.60	1.25	.76	.58	.58
12	.78	2.8	1.55	1.55	1.00	.88	.81	1.40	1.50	.75	.58	.55
13	.76	2.3	1.50	1.45	1.00	.90	.82	1.65	1.65	.74	.57	.66
14	.78	1.85	1.25	1.35	1.00	.91	.84	1.65	1.60	.71	.52	.67
15	.79	1.65	1.20	1.30	.97	.91	.86	1.60	1.55	.71	.52	.68
16	.80	1.50	1.10	1.20	1.00	.92	.88	1.60	1.45	.70	.52	.81
17	.92	1.40	1.10	1.15	1.00	.93	.87	1.70	1.30	.70	.49	.78
18	.95	1.25	1.05	1.20	.97	.94	.87	1.70	.88	.70	.48	.64
19	.89	1.25	1.00	1.25	.93	.94	.88	2.4	.95	.69	.48	.58
20	.94	1.45	1.00	1.20	.91	.95	.88	2.3	.94	.63	.48	.61
21	.91	3.3	.98	1.15	.89	.96	.89	2.05	.93	.62	.57	.63
22	.88	3.8	.96	1.10	.89	.98	.89	1.90	.83	.61	.59	.73
23	.87	3.1	1.05	1.05	.88	.98	.92	1.70	.92	.61	.56	.78
24	.76	2.5	1.20	1.05	.88	.97	.92	1.75	.91	.68	.54	.75
25	.78	2.1	1.30	1.00	.87	.96	.90	1.55	.85	.65	.53	.56
26	.84	1.80	1.40	1.00	.86	.94	1.00	1.50	.86	.64	.52	.55
27	1.00	1.65	1.50	.96	.88	.94	1.00	1.40	.89	.61	.59	.53
28	1.05	1.50	1.40	.98	.90	.92	1.10	1.25	.91	.58	.53	.55
29	.94	1.40	1.40	.97	......	.90	1.25	1.25	.88	.55	.51	.57
30	.94	1.30	1.40	.95	......	.81	1.25	1.30	.77	.55	.53	.59
31	.91	......	1.45	1.00	......	.80	......	1.55	......	.58	.54	......

Daily discharge, in second-feet, of Cedar River near Ravensdale, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	405	484	830	830	540	477	399	717	1,060	392	280	258
2	334	477	793	717	610	477	347	717	1,100	399	269	247
3	540	457	793	717	610	498	353	717	985	399	253	263
4	505	484	830	680	610	498	379	830	985	399	280	269
5	477	477	905	680	610	526	392	1,020	905	405	298	247
6	431	680	1,060	645	610	519	399	1,020	793	411	269	280
7	755	905	1,060	867	610	505	392	985	717	418	247	275
8	526	1,240	1,020	1,240	575	505	373	985	645	418	236	269
9	498	1,200	1,060	1,100	540	498	373	985	610	399	347	286
10	484	2,150	985	1,100	540	484	366	985	680	392	280	292
11	457	3,380	945	1,020	540	470	392	985	717	379	269	269
12	392	2,150	945	945	540	457	411	830	905	373	269	253
13	379	1,620	905	867	540	470	418	1,020	1,020	366	263	316
14	392	1,200	717	793	540	477	431	1,020	985	347	236	322
15	399	1,020	680	755	519	477	444	985	945	347	236	328
16	405	905	610	680	540	484	457	985	867	340	236	411
17	484	830	610	645	540	491	451	1,060	755	340	220	392
18	505	717	575	680	519	498	451	1,060	457	340	215	304
19	463	717	540	717	491	498	457	1,720	505	334	215	269
20	498	867	540	680	477	505	457	1,620	498	298	215	286
21	477	2,740	526	645	463	512	463	1,370	491	292	263	298
22	457	3,380	512	610	463	526	463	1,240	425	286	275	359
23	451	2.500	575	575	457	526	484	1,060	484	286	258	392
24	379	1,820	680	575	457	519	484	1,100	477	328	247	373
25	392	1,420	755	540	451	512	470	945	437	310	241	258
26	431	1.160	830	540	444	498	540	905	444	304	236	253
27	540	1,020	905	512	457	498	540	830	463	286	275	241
28	575	905	830	526	470	484	610	717	477	269	241	253
29	498	830	830	519	......	470	717	717	457	253	231	263
30	498	755	830	505	......	411	717	755	386	253	241	275
31	477	......	867	540	......	405	......	945	......	269	247	......

Note.—Discharge determined from a rating curve well defined between 120 and 5,000 second-feet.

Monthly discharge of Cedar River near Ravensdale, Wash., for the year ending Sept. 30, 1911.

[Drainage area, 149 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	755	334	468	3.14	3.62	28,800	B.
November	3,380	457	1,280	8.59	9.58	76,200	A.
December	1,060	512	792	5.32	6.13	48,700	B.
January	1,240	505	724	4.86	5.60	44,500	B.
February	610	444	527	3.54	3.69	29,300	B.
March	526	405	490	3.29	3.79	30,100	B.
April	717	347	454	3.05	3.40	27,000	B.
May	1,720	717	995	6.68	7.70	61,200	A.
June	1,100	386	689	4.62	5.16	41,000	B.
July	418	253	343	2.30	2.65	21,100	B.
August	347	215	254	1.70	1.96	15,600	B.
September	411	241	293	1.97	2.20	17,400	B.
The year	3,380	215	609	4.09	55.48	441,000	

SKYKOMISH RIVER BASIN.

SOUTH FORK OF SKYKOMISH RIVER NEAR BERLIN, WASH.

Location.—In sec. 20, T. 26 N., R. 11 E., at the county bridge, 1 mile below the Great Northern Railway station at Berlin, and 1¼ miles below Miller River.

Records available.—September 27, 1910, to September 30, 1911; fragmentary.

Drainage area.—Not measured.

Gage.—Vertical staff in three sections.

Channel.—Sand and gravel; practically permanent.

Discharge measurements.—Made from the bridge at the gage.

Estimates withheld for additional data.

Discharge measurements of South Fork of Skykomish River near Berlin, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Nov. 16	H. P. Gilkey	5.10	1,670	Mar. 18	H. P. Gilkey	4.55	1,020
Dec. 15	do	4.45	1,020	May 24	G. L. Parker	5.44	2,210
				July 24	W. W. Clifford	4.50	1,100
1911.				Sept. 28	do	3.70	604
Feb. 6	H. P. Gilkey	3.57	520				
21	do	3.38	430				

Additional gage heights, in feet, of South Fork of Skykomish River near Berlin, Wash., for the year ending Sept. 30, 1911.

Oct. 2, 1910	5.2	Nov. 13	6.0	June 17	6.3
Oct. 12	4.9	Nov. 24	6.6	June 22	5.8
Oct. 30	4.8	Dec. 2	5.4	June 24	5.5
Nov. 1	4.7	Dec. 12	4.7	July 28	4.2
Nov. 8	6.6	May 31, 1911	7.0	Aug. 12	3.5
Nov. 12	6.4	June 4	5.9	Sept. 24	4.2

SOUTH FORK OF SKYKOMISH RIVER NEAR INDEX, WASH.

Location.—In NE. ¼ sec. 29, T. 27 N., R. 10 E., 300 feet above Sunset Falls, 2 miles above North Fork of Skykomish River, and about 2 miles southeast of Index.

Records available.—October 7, 1902, to September 30, 1905; April 26 to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Solid rock at control; practically permanent.

Discharge measurements.—Made from a suspension bridge one-half mile below gage.

Accuracy.—Results good.

Discharge measurements of South Fork of Skykomish River near Index, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 26	H. P. Gilkey	4.79	3,060
June 20	.....do	5.08	3,280
Sept. 29	W. W. Clifford	1.02	662

Daily gage height, in feet, of South Fork of Skykomish River near Index, Wash., for the year ending Sept. 30, 1911.

[L. A. Philipoteaux, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Day.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	4.9	7.2	4.2	1.5	0.4	16	......	6.2	6.7	4.3	0.8	6.5
2	......	5.5	7.0	4.3	1.4	.4	17	......	5.6	6.1	3.9	.7	5.8
3	......	5.9	6.7	4.5	1.3	.5	18	......	6.2	5.9	3.5	.7	3.6
4	......	7.1	5.4	4.7	1.2	.7	19	......	5.7	5.3	3.2	.7	2.9
5	......	6.8	5.3	5.0	1.2	.9	20	......	5.3	5.0	3.0	.9	2.5
6	......	5.8	5.2	4.9	1.2	1.3	21	......	5.3	5.0	2.7	1.0	2.7
7	......	5.0	5.5	4.6	1.2	1.4	22	......	5.5	5.6	2.6	.8	2.7
8	......	5.4	5.3	4.2	1.0	1.5	23	......	5.0	4.9	2.4	.6	2.4
9	......	5.1	5.7	3.8	1.0	1.4	24	......	4.7	4.4	2.3	.6	1.8
10	......	4.5	6.4	3.7	1.0	1.1	25	......	5.2	4.5	2.3	.6	1.6
11	......	4.4	8.8	3.6	1.0	1.0	26	4.8	5.0	5.0	2.3	.5	1.4
12	......	4.3	8.5	3.8	.9	.8	27	4.5	5.1	5.4	2.0	.5	1.3
13	......	4.5	8.2	3.9	.9	3.6	28	4.0	5.3	4.8	1.9	.5	1.2
14	......	4.3	7.5	4.0	.8	2.9	29	4.1	6.0	4.3	1.7	.4	1.1
15	......	4.5	7.0	4.2	.8	4.4	30	4.3	7.3	4.2	1.7	.4	1.0
							31	......	8.1	......	1.6	.4	......

Daily discharge, in second-feet, of South Fork of Skykomish River near Index, Wash., for the year ending Sept. 30, 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Day.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	3,120	5,400	2,570	1,030	620	16	......	4,340	4,860	2,650	752	4,650
2	......	3,660	5,180	2,650	990	620	17	......	3,750	4,240	2,360	716	3,560
3	......	4,040	4,860	2,800	948	650	18	......	4,340	4,040	2,090	716	1,900
4	......	5,290	3,570	2,960	908	716	19	......	3,850	3,480	1,910	716	1,490
5	......	4,960	3,480	3,210	908	790	20	......	3,480	3,210	1,790	790	1,290
6	......	3,940	3,390	3,120	908	948	21	......	3,480	3,210	1,620	828	1,390
7	......	3,210	3,660	2,880	908	990	22	......	3,660	3,750	1,570	752	1,390
8	......	3,570	3,480	2,570	828	1,030	23	......	3,210	3,120	1,460	682	1,240
9	......	3,300	3,850	2,290	828	990	24	......	2,960	2,720	1,410	682	980
10	......	2,800	4,540	2,220	828	868	25	......	3,390	2,800	1,410	682	900
11	......	2,720	7,340	2,160	828	828	26	3,040	3,210	3,210	1,410	650	820
12	......	2,650	6,960	2,290	790	752	27	2,800	3,300	3,570	1,260	650	780
13	......	2,800	6,590	2,360	790	2,160	28	2,430	3,480	3,040	1,210	650	740
14	......	2,650	5,750	2,430	752	1,730	29	2,500	4,140	2,650	1,120	620	700
15	......	2,800	5,180	2,570	752	2,720	30	2,650	5,520	2,570	1,120	620	660
							31	......	6,460	......	1,080	620	......

NOTE.—Discharge Apr. 26 to Sept. 16, 1911, determined from a rating curve well defined between 2,500 and 4,500 second-feet. Discharge Sept. 17 to 30, 1911, determined from a rating curve well defined below 5,000 second-feet.

Monthly discharge of South Fork of Skykomish River near Index, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April 26-30	3,040	2,430	2,680	26,600	A.
May	6,460	2,650	3,680	226,000	A.
June	7,340	2,570	4,120	245,000	A.
July	3,210	1,080	2,080	128,000	B.
August	1,030	620	778	47,800	C.
September	4,650	620	1,300	77,400	B.
The period				751,000	

SKYKOMISH RIVER AT SULTAN, WASH.

Location.—In sec. 5, T. 27 N., R. 8 E., at the county bridge at Sultan.

Records available.—September 26, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on right bank.

Channel.—Sandy and clean; shifting in floods.

Discharge measurements.—Made from the county bridge at the gage.

Accuracy.—Results fair.

Discharge measurements of Skykomish River at Sultan, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Nov. 15	H. P. Gilkey	6.55	4,060	Mar. 17	H. P. Gilkey	5.40	2,330
Dec. 15	.....do	5.40	2,430	Apr. 12	.....do	5.41	2,400
				June 19	.....do	7.04	5,470
1911.				July 21	W. W. Clifford	5.34	2,440
Feb. 4	H. P. Gilkey	4.42	1,280	Sept. 30	.....do	4.20	1,270
20	.....do	4.28	1,190				

Daily gage height, in feet, of Skykomish River at Sultan, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	8.0	5.8	6.8	6.9	4.6	3.9	7.1	6.8	9.3	6.2	4.5	3.9
2	6.5	5.6	6.5	5.6	5.4	4.0	5.9	7.0	8.9	6.4	4.4	3.9
3	11.9	6.6	6.7	5.6	4.5	4.0	5.9	7.4	7.9	6.5	4.4	3.8
4	9.5	6.2	6.4	5.8	4.4	4.1	5.5	8.0	6.8	6.3	4.4	3.8
5	9.0	5.8	6.5	6.0	4.5	4.2	5.7	8.0	7.0	6.5	4.3	3.9
6	8.1	8.4	7.0	6.9	4.4	4.2	5.1	7.6	6.9	6.8	4.3	3.8
7	9.7	10.9	6.9	8.0	4.3	4.4	5.1	7.7	6.9	6.8	4.4	3.8
8	9.5	8.8	6.7	7.0	4.2	4.7	5.0	7.2	7.3	6.2	4.2	4.3
9	7.9	7.6	6.6	6.8	4.3	4.8	5.4	6.9	7.3	6.0	4.2	4.3
10	7.8	11.0	6.3	6.5	4.3	4.8	5.9	6.9	7.5	5.9	4.4	4.3
11	6.7	9.8	5.9	6.1	4.4	4.7	5.7	6.5	8.9	5.9	4.0	4.1
12	6.2	8.9	5.9	5.9	4.5	4.7	5.5	6.5	9.3	6.0	4.0	4.0
13	5.9	7.7	5.8	5.5	4.5	4.4	5.5	6.9	8.9	6.1	4.0	6.7
14	5.5	7.0	5.7	5.3	4.4	4.3	5.0	6.5	8.4	6.4	4.0	5.8
15	5.4	6.7	5.3	5.2	4.3	4.7	5.1	6.7	8.0	6.2	3.9	6.9
16	5.0	6.2	5.4	5.2	4.4	5.1	5.3	7.7	8.0	6.1	3.9	8.1
17	8.0	6.0	5.2	6.0	4.2	5.4	5.2	7.7	7.7	6.0	3.9	6.8
18	7.8	5.8	5.7	6.1	4.4	5.6	5.4	8.0	7.3	6.0	3.9	6.0
19	7.9	5.9	5.2	5.9	4.4	5.5	5.5	7.7	7.0	5.9	3.9	5.4
20	6.2	9.0	5.1	6.0	4.3	6.0	5.5	7.2	6.8	5.9	4.1	5.0
21	5.9	12.0	5.7	5.0	4.3	6.1	5.7	7.2	6.7	5.2	4.1	5.6
22	5.6	10.0	5.4	5.0	4.1	6.2	5.9	7.3	7.3	5.3	4.1	5.5
23	5.5	9.9	8.0	4.8	4.1	7.0	6.0	6.9	6.8	5.0	4.0	5.1
24	6.8	8.3	9.8	4.7	4.1	7.1	6.6	6.7	6.4	5.0	4.0	4.9
25	8.9	7.5	7.8	4.5	4.0	6.7	7.7	6.7	6.0	5.0	4.0	4.7
26	7.5	7.1	6.7	4.7	4.0	6.2	7.7	6.9	6.7	5.0	4.0	4.5
27	6.7	6.7	6.6	4.5	4.0	5.9	6.6	6.9	7.4	4.9	3.8	4.3
28	6.1	6.5	6.3	4.6	4.0	6.6	6.3	7.3	6.8	4.8	3.8	4.3
29	5.9	6.1	6.2	5.0	......	6.4	6.3	7.7	6.4	4.8	3.7	4.2
30	5.45	6.0	6.5	5.5	......	6.4	6.8	8.0	6.3	4.7	3.7	4.7
31	5.6	......	10.0	5.6	......	6.9	......	8.5	......	4.5	3.8	......

Daily discharge, in second-feet, of Skykomish River at Sultan, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	7,600	2,910	4,680	4,890	1,450	900	5,320	4,680	11,100	3,790	1,530	1,040
2	4,090	2,620	4,090	2,620	2,350	970	3,060	5,100	10,000	4,150	1,440	1,040
3	19,300	4,280	4,480	2,620	1,360	970	3,060	6,040	7,350	4,340	1,440	970
4	11,700	3,550	3,900	2,910	1,280	1,040	2,480	7,600	4,930	3,970	1,440	970
5	10,300	2,910	4,090	3,220	1,360	1,120	2,760	7,600	5,330	4,340	1,350	1,040
6	7,860	8,670	5,100	4,890	1,280	1,120	1,980	6,560	5,130	4,930	1,350	970
7	12,300	16,100	4,890	7,600	1,200	1,280	1,980	6,820	5,130	4,930	1,440	970
8	11,700	9,750	4,480	5,100	1,120	1,550	1,870	5,550	5,960	3,790	1,270	1,850
9	7,340	6,560	4,280	4,680	1,200	1,650	2,350	4,890	5,960	3,450	1,270	1,350
10	5,790	16,400	3,720	4,090	1,200	1,650	3,060	4,890	6,400	3,290	1,440	1,350
11	4,480	12,600	3,060	3,380	1,280	1,550	2,760	4,090	10,000	3,290	1,110	1,190
12	3,550	10,000	3,060	3,060	1,360	1,550	2,480	4,090	11,100	3,450	1,110	1,110
13	3,060	6,820	2,910	2,480	1,360	1,280	2,480	4,890	10,000	3,620	1,110	4,730
14	2,480	5,100	2,760	2,220	1,280	1,200	1,870	4,090	8,670	4,150	1,110	3,130
15	2,350	4,480	2,220	2,100	1,200	1,550	1,980	4,480	7,600	3,790	1,040	5,130
16	1,870	3,550	2,350	2,100	1,280	1,980	2,220	6,820	7,600	3,620	1,040	7,860
17	7,600	3,220	2,100	3,220	1,120	2,350	2,100	6,820	6,860	3,450	1,040	4,930
18	7,080	2,910	2,760	3,380	1,280	2,620	2,350	7,600	5,960	3,450	1,040	3,450
19	7,340	3,060	2,100	3,060	1,280	2,480	2,480	6,820	5,330	3,290	1,040	2,540
20	3,550	10,300	1,980	3,220	1,200	3,220	2,480	5,550	4,930	3,290	1,190	2,040
21	3,060	19,600	2,760	1,870	1,200	3,380	2,760	5,550	4,730	2,280	1,190	2,830
22	2,620	13,200	2,350	1,870	1,040	3,550	3,060	5,790	5,960	2,410	1,190	2,680
23	2,480	12,900	7,600	1,650	1,040	5,100	3,220	4,890	4,930	2,040	1,110	2,160
24	4,680	8,400	12,600	1,550	1,040	5,320	4,280	4,480	4,150	2,040	1,110	1,980
25	10,000	6,300	7,080	1,360	970	4,480	6,820	4,480	3,450	2,040	1,110	1,720
26	6,300	5,320	4,480	1,550	970	3,550	6,820	4,890	4,730	2,040	1,110	1,530
27	4,480	4,480	4,280	1,360	970	3,060	4,280	4,890	6,180	1,930	970	1,350
28	3,380	4,090	3,720	1,450	970	4,280	3,720	5,790	4,930	1,820	970	1,350
29	3,060	3,380	3,550	1,870	......	3,900	3,720	6,820	4,150	1,820	900	1,270
30	2,420	3,220	4,090	2,480	......	3,900	4,680	7,600	3,970	1,720	900	1,720
31	2,620	......	13,200	2,620	......	4,890	......	8,940	......	1,530	970	......

NOTE.—Discharge determined from two rating curves, both well defined between 600 and 5,600 second-feet.

Monthly discharge of Skykomish River at Sultan, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
October	19,300	1,870	6,010	370,000
November	19,600	2,620	7,220	430,000
December	13,200	1,980	4,350	267,000
January	7,600	1,360	2,920	180,000
February	2,350	970	1,240	68,900
March	5,320	900	2,500	154,000
April	6,820	1,870	3,150	187,000
May	8,940	4,090	5,780	355,000
June	11,100	3,450	6,420	382,000
July	4,930	1,530	3,160	194,000
August	1,530	900	1,170	71,900
September	7,860	970	2,190	130,000
The year	19,600	900	3,850	2,790,000

FOSS RIVER NEAR SKYKOMISH, WASH.

Location.—In sec. 32, T. 26 N., R. 12 E., one-half mile below the Great Northern Railway crossing, three-fourths mile above the mouth, and about 3 miles east of Skykomish.

Records available.—May 18 to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Gravel and bowlders; shifting in floods.

Discharge measurements.—Made from cable one-half mile below gage.

Estimates withheld for additional data.

Discharge measurements of Foss River near Skykomish, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Aug. 22	Parker and Clifford	1.57	193
Sept. 27	W. W. Clifford	1.48	163

Daily gage height, in feet, of Foss River near Skykomish, Wash., for the year ending Sept. 30, 1911.

Day.	May.	June.	July.	Aug.	Sept.	Day.	May.	June.	July.	Aug.	Sept.
1		2.3	2.1	2.0	1.7	16		2.2	2.8	1.7	2.9
2		2.4	2.1	2.0	1.7	17			2.9	1.7	2.5
3		2.4	2.1	1.9	1.7	18			3.0	1.7	2.2
4		2.4	2.1	1.9	1.7	19			2.8	1.6	2.0
5		2.4	2.2	1.9	1.7	20	2.4	2.3	2.6	1.7	2.0
6		2.4	2.3	1.9	1.8	21	2.3	2.3	2.4	1.6	2.0
7		2.5	2.4	1.9	1.9	22	2.3	2.3	2.3	1.6	1.9
8		2.5	2.4	1.9	1.9	23	2.3	2.3	2.3	1.7	1.8
9		2.5	2.3	1.8	1.9	24	2.3	2.3	2.3	1.7	1.7
10		2.4	2.3	1.8	1.8	25	2.3	2.3	2.3	1.7	1.7
11		2.3	2.3	1.8	1.8	26	2.4	2.3	2.3	1.7	1.6
12		2.3	2.2	1.8	1.7	27	2.4	2.3	2.2	1.7	1.5
13		2.3	2.1	1.8	2.3	28	2.3	2.1	2.1	1.7	1.5
14		2.2	2.1	1.8	2.0	29	2.3	2.1	2.0	1.7	1.4
15		2.2	2.2	1.7	2.6	30	2.3	2.1	2.1	1.7	1.4
						31	2.3		2.1	1.7	

EAST FORK OF FOSS RIVER NEAR SKYKOMISH, WASH.

Location.—At a dam site below Alturas Lake, about 2 miles above the mouth, and about 6 miles south of Skykomish.

Records available.—May 21 to September 30, 1911.

Drainage area.—Not measured.

Gage.—Inclined staff in two sections.

Channel.—Rocky; shifting in floods.

Discharge measurements.—Made from a foot log about one-half mile above gage.

Estimates withheld for additional data.

Discharge measurements of East Fork of Foss River near Skykomish, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 21	G. L. Parker	1.33	114
Aug. 22	Parker and Clifford	1.46	130
Sept. 27	W. W. Clifford	.62	73.5

Daily gage height, in feet, of East Fork of Foss River near Skykomish, Wash., for the year ending Sept. 30, 1911.

Day.	May.	June.	July.	Day.	May.	June.	July.	Day.	May.	June.	July.
1	......	3.3	2.0	11	......	3.7	2.0	21	1.3	2.6	2.4
2	......	3.0	2.1	12	......	3.8	2.2	22	1.45	2.8	2.2
3	......	2.2	2.2	13	......	3.7	2.6	23	1.25	2.4	2.2
4	......	1.7	......	14	......	3.5	2.8	24	1.15	2.1	2.6
5	......	1.5	......	15	......	3.4	2.9	25	1.25	2.2	2.6
6	......	1.6	2.2	16	......	3.2	3.3	26	1.2	3.0	2.4
7	......	1.8	2.5	17	......	3.0	3.0	27	1.25	3.0	2.1
8	......	1.7	2.2	18	......	2.8	2.9	28	1.4	2.6	2.0
9	......	2.2	2.0	19	......	2.6	2.7	29	1.6	2.3	2.0
10	......	2.8	1.9	20	......	2.5	2.5	30	2.4	2.2	......
								31	3.0	......	......

MILLER CREEK NEAR BERLIN, WASH.

Location.—In the NE. ¼ sec. 33, T. 26 N., R. 11 E., 1¼ miles above Berlin and the mouth of the creek.

Records available.—May 24 to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Rocky; shifting in extreme floods.

Discharge measurements.—Made from a cable 900 feet above the gage or by wading.

Estimates withheld for additional data.

Discharge measurements of Miller Creek near Berlin, Wash., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
July 27	Parker and Clifford	0.97	144
Aug. 23	W. W. Clifford	.39	55.1
Sept. 28	.....do	.70	100

Daily gage height, in feet, of Miller Creek near Berlin, Wash., for the year ending Sept. 30, 1911.

Day.	May.	June.	July.	Aug.	Sept.	Day.	May.	June.	July.	Aug.	Sept.
1	....	3.2	1.8	0.68	0.20	16	....	2.2	....	0.30	3.1
2	....	2.8	1.85	.60	....	17	....	2.2	....	.25	....
3	....	2.2	2.0	.58	.20	18	....	2.2	1.6	.25	1.8
4	....	2.0	2.0	.58	....	19	....	2.1	1.55	.25	1.65
5	....	1.8	2.1	....	.25	20	....	2.0	1.4	.80	....
6	....	1.95	2.2	.50	1.4	21	....	2.1	1.3	.62	....
7	....	2.1	2.3	.55	1.1	22	....	2.2	1.0	.50	....
8	....	2.0	1.9	.55	....	23	....	2.0	....	.40	1.2
9	....	2.1	....	.50	....	24	1.85	1.75	1.1	....	1.05
10	....	2.6	1.7	.45	.80	25	....	1.75	1.1	.35	....
11	....	3.7	1.65	.40	.75	26	1.9	2.1	1.0	.30	....
12	....	3.3	1.85	.40	.55	27	2.1	2.3	.92	.25	.70
13	....	3.1	....	.35	2.5	28	2.3	2.0	.85	....	.70
14	....	2.8	1.9	.35	1.6	29	....	1.9	.80	....	.60
15	....	2.7	2.1	.32	2.9	30	2.8	1.85	.80	.20	....
						31	3.0	....	.72	.20	....

WEST FORK OF MILLER CREEK NEAR BERLIN, WASH.

Location.—About 600 feet above the East Fork trail crossing, about 1 mile above the mouth, and about 4 miles south of Berlin.

Records available.—May 23 to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on left bank.

Channel.—Rocky; shifting in floods.

Discharge measurements.—Made from a foot log near the gage.

Estimates withheld for additional data.

Discharge measurements of West Fork of Miller Creek near Berlin, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 23	G. L. Parker	1.95	136
July 26	Parker and Clifford	1.26	37.5
Sept. 28	W. W. Clifford	.94	24.1

Daily gage height, in feet, of West Fork of Miller Creek near Berlin, Wash., for the year ending Sept. 30, 1911.

Day.	May.	June.	July.	Aug.	Sept.	Day.	May.	June.	July.	Aug.	Sept.
1		3.05		0.95	0.49	16		2.30	2.20	0.61	3.05
2		3.05		.95	.48	17		2.20	2.02	.60	2.10
3		2.10	2.15	.89	.58	18		2.15	1.86	.62	1.78
4		1.88	2.10	.84	.58	19		2.00	1.65	.54	1.56
5		1.72	2.30	.86	.52	20		1.95	1.55	1.38	1.52
6		1.92	2.30	1.02	1.80	21		2.00	1.45	1.04	1.78
7		2.05	2.10	.84	1.20	22		2.20	1.32	.82	1.68
8		1.95	1.81	.82	.88	23	1.95	1.85	1.45	.72	1.40
9		2.15	1.78	.86	1.38	24	2.10	1.62	1.45	.66	1.30
10		2.65	1.76	.88	1.08	25	2.10	2.20	1.48	.62	1.15
11		3.30	1.82	.84	.92	26	2.20	2.55	1.45	.59	1.05
12		3.35	2.05	.80	.85	27	2.30	1.98	1.18	.56	1.00
13		3.00	2.15	.76	2.75	28	2.40	1.90	1.12	.52	.98
14		2.55	2.10	.66	1.75	29	2.60	1.98	1.00	.52	.91
15		2.65	2.25	.64	2.90	30	2.70	1.95	1.00	.54	.88
						31	3.20		.98	.49	

NORTH FORK OF SKYKOMISH RIVER AT INDEX, WASH.

Location.—In sec. 17, T. 27 N., R. 10 E., at Index, 1 mile above the mouth.

Records available.—August 24, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on wing dam 300 yards above the railroad bridge. August 24 to October 25, 1910, gage was located 100 feet above the tramway bridge.

Channel.—Rocks and gravel; shifting.

Discharge measurements.—Made from a cable 300 feet below the gage.

Accuracy.—Results good.

Discharge measurements of North Fork of Skykomish River at Index, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 26	Kimble and Gilkey....	3.35	1,710	Mar. 18	H. P. Gilkey...........	2.70	754
Nov. 17	H. P. Gilkey...........	2.68	805	Apr. 13	.....do................	2.53	617
Dec. 15	.....do................	2.52	624	26	.....do................	3.58	1,360
				June 20	.....do................	3.76	1,780
1911.				July 22	W. W. Clifford.........	2.65	736
Feb. 5	H. P. Gilkey...........	1.88	267	Aug. 24	.....do................	1.84	246
6	.....do................	1.87	264	Sept. 29	.....do................	2.02	327
21	.....do................	1.77	219				

Daily gage height, in feet, of North Fork of Skykomish River at Index, Wash., for the year ending Sept. 30, 1911.

[Lee Pickett, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	2.6	2.8	2.7	2.1	1.7	3.1	3.6	3.4	3.4	2.3	1.7
2	......	2.6	3.4	2.5	1.9	1.7	3.0	3.8	4.7	3.6	2.3	1.6
3	......	3.1	3.4	2.5	1.9	1.7	2.8	4.0	4.6	3.3	2.2	1.7
4	......	2.9	3.1	2.5	1.9	1.7	2.7	4.8	4.4	3.5	2.2	1.7
5	......	2.6	3.2	2.7	1.7	1.8	2.5	4.3	3.5	3.5	2.2	1.7
6	......	3.4	3.4	3.0	1.9	1.8	2.5	3.9	3.9	3.5	2.1	2.5
7	......	5.5	3.4	4.2	1.9	2.0	2.4	3.8	3.7	3.5	2.1	2.0
8	......	4.0	3.3	3.4	1.8	2.0	2.5	3.7	3.7	3.4	2.0	1.5
9	......	3.5	3.2	3.3	1.9	2.0	2.8	3.6	3.9	3.2	2.0	1.0
10	......	7.5	3.0	3.0	1.8	2.0	2.9	3.5	4.5	3.1	2.0	1.9
11	......	5.0	2.8	2.8	1.8	2.2	2.8	3.4	5.3	3.1	2.0	1.9
12	......	4.0	2.8	2.6	1.8	2.2	2.9	3.4	5.6	3.3	1.9	1.8
13	......	3.5	2.8	2.5	1.9	2.0	2.7	3.4	5.3	3.4	1.9	3.8
14	......	3.1	2.8	2.4	1.8	2.3	2.6	3.4	4.7	3.4	1.9	2.9
15	......	2.9	2.6	2.4	1.7	2.4	2.4	4.1	4.6	3.5	1.9	4.2
16	......	2.5	2.6	2.4	1.7	2.7	2.6	4.0	4.3	3.7	1.9	4.0
17	......	2.5	2.6	2.3	1.8	2.7	2.6	4.1	4.3	3.5	1.9	3.5
18	......	2.4	2.4	2.5	1.8	2.8	2.8	4.2	3.6	3.3	1.8	3.3
19	......	2.5	2.4	2.4	1.8	2.8	2.8	3.9	3.6	3.1	1.8	2.8
20	......	5.2	2.4	2.2	1.7	3.0	2.7	3.7	3.7	3.0	2.0	2.6
21	......	9.7	2.4	2.1	1.7	3.1	3.0	3.7	3.7	2.8	1.8	2.6
22	......	5.5	2.4	2.0	1.7	3.2	3.0	3.7	3.8	2.8	1.8	2.6
23	......	4.8	3.9	2.0	1.7	3.7	3.0	3.5	3.7	2.6	1.8	2.5
24	......	4.0	4.4	2.0	1.7	3.5	3.5	3.5	3.4	2.7	1.8	2.3
25	......	3.6	3.6	1.9	1.7	3.5	4.0	3.6	3.3	2.6	1.8	2.3
26	3.4	3.3	3.3	2.0	1.7	3.0	3.5	3.6	3.8	2.5	1.8	2.2
27	3.1	3.1	3.2	1.9	1.7	2.7	3.4	3.7	4.0	2.5	1.7	2.2
28	2.9	3.0	3.1	2.0	1.7	2.7	3.3	3.8	3.6	2.5	1.7	2.2
29	2.8	2.9	3.0	1.9	....	2.8	3.3	4.1	3.5	2.4	1.7	2.1
30	2.6	2.8	3.2	1.9	......	3.0	3.4	4.8	3.5	2.4	1.7	2.0
31	2.5	......	2.9	2.0	......	2.9	......	5.6	......	2.3	1.7	......

Daily discharge, in second-feet, of North Fork of Skykomish River at Index, Wash., for Aug. 24, 1910, to Sept. 30, 1911.

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	276	......	1,070	830	755	375	182	1,060	1,480	3,380	1,300	490	182
2	......	276	......	1,070	1,300	615	270	182	980	1,660	2,570	1,480	490	144
3	......	......	......	1,490	1,300	615	270	182	830	1,840	2,460	1,220	430	182
4	......	......	......	1,310	1,060	615	270	182	755	2,680	2,240	1,390	430	182
5	......	......	......	1,070	1,140	755	182	224	615	2,140	1,390	1,390	430	182
6	......	......	......	1,760	1,300	980	270	224	615	1,750	1,750	1,390	375	615
7	......	......	......	4,120	1,300	2,040	270	320	550	1,660	1,570	1,390	375	320
8	......	......	......	2,360	1,220	1,300	224	320	615	1,570	1,570	1,300	320	110
9	......	......	......	1,850	1,140	1,220	270	320	830	1,480	1,750	1,140	320	320
10	......	......	......	6,760	980	980	224	320	905	1,390	2,350	1,060	320	270
11	......	......	......	3,060	830	830	224	430	830	1,300	3,260	1,060	320	270
12	......	......	......	1,960	830	685	224	430	905	1,300	3,620	1,220	270	224
13	......	......	......	1,470	830	615	270	320	755	1,300	3,260	1,300	270	1,060
14	......	......	......	1,120	830	550	224	490	685	1,300	2,570	1,300	270	905
15	......	......	......	960	685	550	182	550	550	1,940	2,460	1,390	270	2,040
16	......	......	......	670	685	550	182	755	685	1,840	2,140	1,570	270	1,840
17	......	......	......	670	685	490	224	755	685	1,940	2,140	1,390	270	1,390
18	......	......	......	600	550	615	224	830	830	2,040	1,480	1,220	224	1,220
19	......	......	......	670	550	550	224	830	830	1,750	1,480	1,060	224	830
20	......	......	......	3,290	550	430	182	980	755	1,570	1,570	980	320	685
21	......	......	......	9,160	550	375	182	1,060	980	1,570	1,570	830	224	685
22	......	......	......	3,500	550	320	182	1,140	980	1,570	1,660	830	224	685
23	......	......	......	2,680	1,750	320	182	1,570	980	1,390	1,570	685	224	615
24	278	......	......	1,840	2,240	320	182	1,390	1,390	1,390	1,300	755	224	490
25	276	......	......	1,480	1,480	270	182	1,390	1,840	1,480	1,220	685	224	490
26	274	......	1,760	1,220	1,220	320	182	980	1,390	1,480	1,660	615	224	430
27	272	168	1,490	1,060	1,140	270	182	755	1,300	1,570	1,840	615	182	430
28	272	......	1,310	980	1,060	320	182	755	1,220	1,660	1,480	615	182	430
29	272	......	1,230	905	980	270	......	830	1,220	1,940	1,390	550	182	375
30	272	......	1,070	830	1,140	270	......	980	1,300	2,680	1,390	550	182	320
31	274	......	990	......	905	320	......	905	......	3,620	......	490	182	......

NOTE.—Discharge Aug. 24 to Nov. 20, 1910, determined from three poorly defined rating curves. Discharge Nov. 21, 1910, to Sept. 30, 1911, determined from a rating curve well defined between 150 and 1,000 second-feet, and fairly well defined between 1,000 and 3,000 second-feet.

Monthly discharge of North Fork of Skykomish River at Index, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October 26–31	1,760	990	1,310	15,600	B.
November	9,160	600	2,030	121,000	C.
December	2,240	550	1,020	62,700	B.
January	2,040	270	617	37,900	A.
February	375	182	223	12,400	A.
March	1,570	182	664	40,800	A.
April	1,840	550	929	55,300	A.
May	3,620	1,300	1,750	108,000	B.
June	3,620	1,220	2,000	119,000	B.
July	1,570	490	1,060	65,200	B.
August	490	182	288	17,700	A.
September	2,040	110	617	36,700	A.
The period	....	....	....	692,000	

PILCHUCK RIVER NEAR GRANITE FALLS, WASH.

Location.—In the SW. ¼ sec. 30, T. 30 N., R. 7 E., at a highway bridge one-fourth mile above Bosworth Lake outlet, 1 mile above Swartz Lake outlet, and about 2 miles southeast of Granite Falls.

Records available.—May 31 to October 12, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on left bank.

Channel.—Rocky; practically permanent.

Discharge measurements.—Made from the highway bridge, 30 feet below the gage, or by wading.

Accuracy.—Results good.

Cooperation.—Gage-height record furnished by the Granite Falls Electric Co.

Discharge measurements of Pilchuck River near Granite Falls, Wash., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 31	H. P. Gilkey	4.88	262
June 17	.....do	4.36	126
July 4	W. W. Clifford	4.36	116
Aug. 27	.....do	3.89	42.1

Daily gage height, in feet, and discharge, in second-feet, of Pilchuck River near Granite Falls, Wash., for 1911.

[C. H. Cleaver, observer.]

Day.	May.		June.		July.		August.		September.		October.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1			4.8	238	4.5	154	3.98	54	3.88	42	4.1	70
2			4.7	208		148	3.96	51	3.88	42		63
3			4.6	180	4.45	142	3.96	51	3.88	42	4.0	56
4			4.5	154	4.4	129	3.96	51	4.0	56	4.1	70
5			4.4	129	4.3	107	3.96	51	4.4	129	4.05	63
6			4.5	154	4.4	129	3.96	51	5.3	408	4.05	63
7			4.6	180	4.55	167	3.98	54	4.5	154		62
8			4.6	180	4.45	142	4.0	56	4.3	107		61
9			4.6	180	4.3	107	3.98	54	4.5	154		60
10			4.7	208	4.25	97	3.96	51	4.3	107		58
11			4.8	238	4.2	87	3.96	51	4.15	78		57
12			4.8	238	4.25	97	3.94	49	4.7	208	4.0	56
13			4.7	208	4.25	97	3.92	46	7.9	2,150		
14			4.7	208	4.2	87	3.9	44	4.9	268		
15			4.7	208	4.2	87	3.9	44	4.9	268		
16			4.6	180	4.2	87	3.9	44	6.0	710		
17			4.35	118	4.2	87	3.88	42	4.7	208		
18			4.4	129	4.15	78	3.88	42	4.5	154		
19			4.4	129	4.1	70	4.0	56	4.9	268		
20			4.4	129	4.1	70	4.5	154	4.8	238		
21			4.4	129	4.1	70	4.2	87		223		
22			4.4	129	4.1	70	4.0	56	4.7	208		
23			4.3	107	4.05	63	3.98	54	4.6	180		
24			4.3	107	4.05	63	3.96	51	4.45	142		
25			4.25	97	4.0	56	3.92	46	4.4	129		
26			5.25	389	4.0	56	3.9	44	4.4	129		
27			4.7	208	4.0	56	3.9	44		108		
28			4.45	142	4.0	56	3.9	44	4.2	87		
29			4.45	142	3.98	54	3.9	44	4.20	87		
30			4.4	129	3.98	54	3.9	44	4.15	78		
31	4.9	268			3.98	54	3.9	44				

NOTE.—Discharge determined from a rating curve well defined between 40 and 300 second-feet. Discharge interpolated for days when no gage height was reported.

Monthly discharge of Pilchuck River near Granite Falls, Wash., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
June	389	97	172	10,200	A.
July	167	54	91.0	5,600	A.
August	154	42	53.4	3,280	A.
September	2,150	42	239	14,200	A.
October 1-12	70	56	61.6	1,470	A.
The period	....	....	....	34,800	

STILLAGUAMISH RIVER BASIN.

SOUTH FORK OF STILLAGUAMISH RIVER AT SILVERTON, WASH.

Location.—In the SE. ¼ sec. 28, T. 30 N., R. 9 E., at the Silverton ranger station, one-fourth mile above Blackjack Creek, half a mile below Martin Creek, and about 5 miles above Gold Basin.

Records available.—September 1, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on right bank.

Channel.—Gravel; shifting in floods.

Discharge measurements.—Made from a cable or by wading near the gage.

Estimates withheld for additional data.

Discharge measurements of South Fork of Stillaguamish River at Silverton, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 15	H. P. Gilkey	0.49	186
May 28	.....do	2.22	655
Aug. 29	W. W. Clifford	1.00	67.1

Daily gage height, in feet, of South Fork of Stillaguamish River at Silverton, Wash., for the year ending Sept. 30, 1911.

[L. D. Hurt, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	1.9	1.7	......	0.2	0.0	1.0	2.3	2.9	1.8	1.3	1.0
2	2.5	2.9	1.8	......	.2	.0	1.0	2.4	2.5	1.9	1.3	1.0
3	6.0	2.3	1.6	......	.1	.1	.7	2.7	2.1	1.9	1.3	1.0
4	4.1	2.0	2.2	......	.1	.1	.6	3.1	2.0	2.0	1.3	1.1
5	3.3	3.1	2.6	......	.1	.1	.5	2.7	1.9	2.1	1.3	1.2
6	3.0	3.0	2.4	......	.1	.2	.5	2.4	1.8	2.1	1.3	1.5
7	1.5	3.9	2.5	......	.1	.4	.5	2.2	1.9	2.0	1.3	2.0
8	1.6	2.6	2.5	......	.1	.4	.5	2.3	1.6	1.8	1.3	2.0
9	1.3	5.0	2.3	......	.2	.4	.9	2.3	1.8	1.7	1.2	1.8
10	1.3	4.8	2.0	......	.2	.4	.9	2.1	2.0	1.7	1.2	1.8
11	1.5	2.8	1.6	......	.1	.3	.7	2.1	2.5	1.8	1.2	1.4
12	2.1	2.4	1.5	......	.1	.2	.6	2.1	3.0	1.9	1.1	1.2
13	2.0	2.1	1.5	......	.2	.2	.5	2.1	2.7	2.1	1.1	1.2
14	2.5	1.9	1.4	......	.1	.2	.7	2.1	2.5	2.1	1.1	2.5
15	2.5	1.8	1.6	1.7	.2	.3	.5	2.3	2.4	2.0	1.1	2.5
16	2.0	1.8	1.6	1.8	.2	.6	.6	2.4	2.2	2.2	1.0	2.5
17	2.0	1.7	1.7	1.7	.1	.7	.6	2.4	2.1	2.1	1.0	2.0
18	3.5	1.6	1.7	1.7	.1	.7	.8	2.6	2.0	1.9	1.0	1.7
19	2.1	2.1	1.6	1.8	.1	.8	.7	2.4	2.0	1.8	1.1	1.9
20	1.9	7.0	1.8	.7	.2	1.0	.7	2.2	1.9	1.7	1.5	1.5
21	1.7	4.4	1.8	.5	.1	.1	.8	2.2	2.0	1.6	1.3	1.7
22	1.7	2.8	3.0	.4	.1	1.1	.9	2.2	2.0	1.6	1.2	1.7
23	1.6	2.6	4.8	.3	.1	1.5	1.0	2.1	1.8	1.8	1.1	1.6
24	3.2	2.2	4.2	.4	.2	1.4	2.5	2.0	1.8	1.7	1.0	1.5
25	3.0	2.0	......	.3	.1	1.0	2.3	2.1	2.0	1.6	1.0	1.4
26	2.1	1.8	......	.0	.1	.8	2.2	2.1	2.8	1.5	1.0	1.4
27	2.0	1.7	......	......	.1	.7	1.9	2.1	2.2	1.4	1.0	1.4
28	1.8	1.6	......	......	.1	.7	1.9	2.2	2.0	1.5	1.0	1.3
29	1.7	1.5	......	......	......	.6	2.0	2.6	1.9	1.4	1.0	1.3
30	1.6	1.7	......	......	......	.7	2.2	2.8	1.8	1.4	1.0	1.3
31	1.7	......	......	.3	......	.9	......	3.3	......	1.4	1.0	......

SOUTH FORK OF STILLAGUAMISH RIVER NEAR GRANITE FALLS, WASH.

Location.—In SW. ¼ sec. 12, T. 30 N., R. 6 E., at lower county bridge, 300 feet below Canyon Creek, and about 1½ miles north of Granite Falls.

Records available.—June 19 to September 30, 1911.

Drainage area.—Not measured.

Gage.—Chain.

Channel.—Sand and gravel; shifting.

Discharge measurements.—Made from highway bridge at gage.

Accuracy.—Results good.

Discharge measurements of South Fork of Stillaguamish River near Granite Falls, Wash., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 17	H. P. Gilkey	3.24	873	July 4	W. W. Clifford	3.39	973
June 1	.....do	5.04	2,570	Aug. 27	.....do	1.96	203
18	.....do	3.80	1,400	Oct. 31	.....do	1.93	228

Daily gage height, in feet, and discharge, in second-feet, of South Fork of Stillaguamish River near Granite Falls, Wash., for 1911.

[E. W. Robinson, observer.]

Day.	June.		July.		Aug.		Sept.		Oct.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	......	......	3.6	1,140	2.4	390	1.8	170	......	292
2	......	......	......	1,180	2.4	390	1.9	200	2.1	265
3	......	......	3.7	1,220	2.2	305	......	210	2.1	265
4	......	......	......	1,180	2.2	305	......	220	2.1	265
5	......	......	3.6	1,140	2.2	305	2.0	230	2.0	230
6	......	......	3.8	1,300	......	305	3.1	775	2.1	265
7	......	......	4.0	1,470	2.2	305	2.6	485	2.0	230
8	......	......	3.6	1,140	2.2	305	2.7	535	......	215
9	......	......	......	958	2.2	305	2.9	650	1.9	200
10	......	......	3.1	775	2.1	265	......	650	2.2	305
11	......	......	3.2	840	2.1	265	......	650	2.1	265
12	......	......	3.3	910	2.1	265	2.9	650	2.0	230
13	......	......	3.6	1,140	......	248	5.2	2,740	1.9	200
14	......	......	3.7	1,220	2.0	230	3.7	1,220	5.2	2,740
15	......	......	3.7	1,220	1.9	200	4.2	1,650	......	1,760
16	......	......	......	1,180	1.9	200	5.5	3,100	3.1	775
17	......	......	3.6	1,140	1.9	200	......	2,040	2.8	590
18	......	......	3.4	985	1.9	200	3.4	985	2.6	485
19	3.7	1,220	3.2	840	1.9	200	3.0	710	2.4	390
20	3.6	1,140	3.1	775	......	368	2.7	535	2.4	390
21	3.6	1,140	2.9	650	2.7	535	2.6	485	2.2	305
22	3.7	1,220	2.8	590	2.4	390	3.9	1,380	......	285
23	3.4	985	......	590	2.4	390	3.4	985	2.1	265
24	3.3	910	2.8	590	2.1	265	......	760	2.5	435
25	......	1,760	2.8	590	2.0	230	2.7	535	2.4	390
26	5.1	2,620	2.7	535	2.0	230	2.6	485	2.2	305
27	4.2	1,650	2.6	485	......	215	2.4	390	2.0	230
28	3.9	1,380	2.6	485	1.9	200	2.4	390	2.0	230
29	3.7	1,220	2.6	485	1.9	200	2.3	345	......	230
30	3.7	1,220	......	460	1.9	200	......	318	2.0	230
31	......	......	2.5	435	1.9	200	......	......	1.8	170

NOTE.—Discharge determined from a well-defined rating curve. Discharge interpolated for days when no gage height was reported.

Monthly discharge of South Fork of Stillaguamish River near Granite Falls, Wash., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
June 19-30	2,620	910	1,370	32,600
July	1,470	435	892	54,800
August	535	200	278	17,100
September	3,100	170	816	48,600
October	2,740	170	433	26,600
The period				180,000

SKAGIT RIVER BASIN.

SKAGIT RIVER NEAR MARBLEMOUNT, WASH.

Location.—In the SE. ¼ sec. 21, T. 37 N., R. 12 E., at proposed power-house site of the Skagit Power Co., 1 mile above Goodell Creek, 6½ miles below Stetattle Creek, and about 16 miles above Marblemount.

Records available.—December 21, 1908, to September 30, 1911.

Drainage area.—1,090 square miles.

Gage.—Vertical staff on right bank.

Channel.—Heavy bowlders; shifting in extreme floods.

Discharge measurements.—Made from a cable at the gage.

Accuracy.—Results good.

Cooperation.—Gage-height record and a part of the discharge measurements furnished by the Skagit Power Co.

Discharge measurements of Skagit River near Marblemount, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Dec. 29	H. P. Gilkey	2.64	2,390	Mar. 14	F. C. Ebert	1.19	990
				Mar. 14	J. E. Rossel	1.19	1,060
1911.				Sept. 12	W. W. Clifford	2.96	3,000
Mar. 8	H. P. Gilkey	1.19	1,050				

Daily gage height, in feet, of Skagit River near Marblemount, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	4.51	3.71	3.61	2.4	1.5	1.0	3.6	5.4	10.5	6.3	4.4	3.8
2	3.05	3.65	3.84	2.3	1.4	1.0	3.6	6.0	10.4	6.2	4.5	3.7
3	4.70	3.57	3.75	2.3	1.3	1.0	3.5	6.1	9.2	6.2	4.6	4.0
4	3.64	3.36	3.69	2.3	1.3	1.0	3.3	6.4	7.9	6.0	4.7	3.7
5	3.73	3.26	3.63	2.3	1.3	1.0	3.1	6.9	6.9	6.3	4.5	3.3
6	6.81	4.07	3.61	2.3	1.3	1.1	3.0	6.4	6.6	7.1	5.0	3.2
7	7.29	6.30	3.61	2.6	1.3	1.1	2.9	5.9	6.7	6.9	4.3	3.1
8	6.66	5.94	3.54	2.4	1.3	1.2	2.8	5.6	6.8	6.0	4.1	3.0
9	7.35	5.24	3.49	2.5	1.3	1.2	3.0	5.3	7.2	5.5	3.8	2.8
10	5.83	7.70	3.34	2.3	1.3	1.3	3.1	4.9	7.5	5.3	3.8	2.8
11	4.97	7.35	3.15	2.1	1.3	1.2	3.0	4.7	9.6	5.3	3.7	2.8
12	4.41	6.35	3.05	2.0	1.2	1.2	2.9	4.6	11.0	5.4	3.7	3.2
13	3.96	5.61	2.96	1.9	1.2	1.2	2.8	4.6	11.6	6.0	3.5	4.3
14	3.72	5.04	2.84	1.9	1.2	1.2	2.6	4.5	11.6	6.5	3.3	3.6
15	4.00	4.58	2.76	2.0	1.2	1.3	2.6	5.0	10.6	7.1	3.2	4.3
16	4.15	4.23	2.69	2.2	1.2	1.5	2.7	6.3	9.9	7.3	3.3	3.8
17	5.70	3.95	2.63	2.0	1.1	1.7	2.7	6.5	9.2	7.3	3.4	3.2
18	4.95	3.81	2.53	2.0	1.1	1.8	2.8	6.3	8.5	6.8	3.6	2.9
19	4.25	3.61	2.50	1.9	1.0	2.0	2.8	6.0	7.7	6.4	3.6	2.7
20	3.86	4.61	2.55	1.8	1.1	2.4	2.8	5.8	7.2	6.2	3.8	2.6
21	3.54	10.30	2.56	1.8	1.1	2.8	3.1	6.0	7.0	5.8	3.2	3.0
22	3.33	7.91	2.45	1.8	1.0	3.0	3.4	6.6	7.4	5.2	3.2	2.8
23	3.13	6.88	3.07	1.7	1.0	3.7	3.8	6.2	7.0	5.1	3.4	2.5
24	5.15	6.07	3.00	1.7	1.0	3.9	4.6	5.8	6.6	5.6	3.3	2.3
25	8.80	5.44	2.85	1.7	1.0	3.7	5.5	5.8	6.6	6.0	3.2	2.2
26	6.31	4.90	2.95	1.6	1.0	3.4	5.3	5.6	7.6	5.7	3.1	2.1
27	5.33	4.55	2.88	1.6	1.0	3.2	5.1	5.5	8.1	5.2	3.1	2.0
28	4.80	4.24	2.73	1.6	.9	3.0	4.9	5.8	7.4	5.0	3.1	2.0
29	4.34	3.95	2.66	1.5	......	2.9	4.9	6.3	6.6	5.1	3.1	1.9
30	4.00	3.76	2.67	1.5	......	3.0	5.0	7.4	6.2	5.0	3.5	1.8
31	3.75	......	2.55	1.5	......	3.3	......	9.2	......	4.7	3.8	......

Daily discharge, in second-feet, of Skagit River near Marblemount, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	5,400	3,930	3,760	2,110	1,240	920	3,740	7,280	22,100	9,360	5,190	4,080
2	2,910	3,820	4,150	2,000	1,170	920	3,740	8,640	21,700	9,120	5,380	3,910
3	5,780	3,690	4,000	2,000	1,100	920	3,580	8,888	17,500	9,120	5,580	4,440
4	3,810	3,360	3,900	2,000	1,100	920	3,270	9,600	13,500	8,640	5,780	3,910
5	3,960	3,210	3,790	2,000	1,100	920	2,980	10,800	10,800	9,360	5,380	3,270
6	10,600	4,570	3,760	2,000	1,100	970	2,840	9,600	10,100	11,400	6,410	3,120
7	11,900	9,340	3,760	2,350	1,100	970	2,710	8,410	10,400	10,800	5,000	2,980
8	10,200	8,500	3,640	2,110	1,100	1,030	2,590	7,720	10,600	8,640	4,620	2,840
9	12,000	6,930	3,560	2,230	1,100	1,030	2,840	7,060	11,600	7,500	4,080	2,590
10	8,250	13,000	3,330	2,000	1,100	1,100	2,980	6,200	12,400	7,060	4,080	2,590
11	6,350	12,000	3,050	1,780	1,100	1,030	2,840	5,780	18,900	7,060	3,910	2,590
12	5,210	9,460	2,910	1,680	1,030	1,030	2,710	5,580	24,100	7,280	3,910	3,120
13	4,370	7,740	2,790	1,580	1,030	1,030	2,590	5,580	26,500	8,640	3,580	5,000
14	3,940	6,490	2,640	1,580	1,030	1,030	2,350	5,380	26,500	9,850	3,270	3,740
15	4,440	5,540	2,540	1,680	1,030	1,100	2,350	6,410	22,500	11,400	3,120	5,000
16	4,720	4,870	2,460	1,890	1,030	1,240	2,470	9,360	20,000	11,900	3,270	4,080
17	7,950	4,350	2,390	1,680	970	1,400	2,470	9,850	17,500	11,900	3,420	3,120
18	6,300	4,100	2,270	1,680	970	1,490	2,590	9,360	15,800	10,600	3,740	2,710
19	4,900	3,760	2,230	1,580	920	1,680	2,590	8,640	13,000	9,600	3,740	2,470
20	4,190	5,600	2,290	1,490	970	2,110	2,590	8,180	11,600	9,120	4,080	2,350
21	3,640	21,300	2,300	1,490	970	2,590	2,980	8,640	11,100	8.180	3,120	2,840
22	3,320	13,600	2,170	1,490	920	2,840	3,420	10,100	12,100	6,840	3,120	2,590
23	3,020	10,800	2,940	1,400	920	3,910	4,080	9,120	11,100	6,620	3,420	2,230
24	6,730	8,800	2,840	1,400	920	4,260	5,580	8,180	10,100	7,720	3,270	2,000
25	16,300	7,370	2,650	1,400	920	3,910	7,500	8,180	10,100	8,640	3,120	1,890
26	9,360	6,200	2,780	1,320	920	3,420	7,060	7,720	12,700	7,950	2,980	1,780
27	7,130	5,480	2,690	1,320	920	3,120	6,620	7,500	14,100	6,840	2,980	1,680
28	5,990	4,890	2,510	1,320	870	2,840	6,200	8,180	12,100	6,410	2,980	1,680
29	5,080	4,350	2,420	1,240	......	2,710	6,200	9,360	10,100	6,620	2,980	1,580
30	4,440	4,010	2,430	1,240	......	2,840	6,410	12,100	9,120	6,410	3,580	1,490
31	4,000	......	2,290	1,240	......	3,270	......	17,500	......	5,780	4,080	......

Note.—Discharge determined from a rating curve well defined between 1,000 and 14,000 second-feet.

Monthly discharge of Skagit River near Marblemount, Wash., for the year ending Sept. 30, 1911.

[Drainage area, 1,090 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	16,300	2,190	6,330	5.81	6.70	389,000	A.
November	21,300	3,210	7,040	6.46	7.21	419,000	A.
December	4,150	2,170	2,940	2.70	3.11	181,000	A.
January	2,350	1,240	1,690	1.55	1.79	104,000	A.
February	1,240	870	1,020	.936	.97	56,600	A.
March	4,260	920	1,890	1.73	1.99	116,000	A.
April	7,500	2,350	3,760	3.45	3.85	224,000	A.
May	17,500	5,380	8,540	7.83	9.03	525,000	A.
June	26,500	9,120	15,000	13.8	15.40	893,000	A.
July	11,900	5,780	8,590	7.88	9.08	528,000	A.
August	6,410	2,980	3,970	3.64	4.20	244,000	A.
September	5,000	1,490	2,920	2.68	2.99	174,000	A.
The year	26,500	870	5,320	4.88	66.32	3,850,000	

SKAGIT RIVER NEAR SEDRO WOOLLEY, WASH.

Location.—In the NE. ¼ sec. 36, T. 35 N., R. 4 E., at the Northern Pacific Railway bridge just above Sterling Bend, 1½ miles south of Sedro Woolley, and about 25 miles above the mouth.

Records available.—May 1, 1908, to September 30, 1911.

Drainage area.—2,930 square miles.

Gage.—Vertical staff on center pier of draw span.

Channel.—Gravel; shifting in floods.

Discharge measurements.—Made from the railway bridge.

Accuracy.—Results good.

Discharge measurements of Skagit River near Sedro Woolley, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 13	Kimble and Gilkey	39.65	14,000	May 20	H. P. Gilkey	40.60	21,900
				June 13	.....do	47.63	57,900
1911.				30	.....do	41.06	28,200
Mar. 2	H. P. Gilkey	35.98	4,260	Sept. 7	W. W. Clifford	37.98	10,200
Apr. 12	.....do	38.14	11,000				

Daily gage height, in feet, of Skagit River near Sedro Woolley, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	40.1	38.8	39.6	38.8	36.9	36.0	38.4	39.5	45.5	41.0	39.2	38.2
2	40.5	39.1	40.4	38.5	36.8	36.0	38.5	40.3	46.1	41.0	39.0	38.4
3	44.0	39.6	41.0	38.4	36.7	36.0	38.4	40.8	44.6	41.2	39.1	38.4
4	44.2	39.4	40.4	38.5	36.6	36.0	38.2	41.6	42.7	41.0	39.1	38.4
5	42.5	39.0	40.3	38.6	36.7	36.0	38.0	42.9	41.6	41.0	39.1	38.0
6	41.7	39.6	41.0	38.7	36.6	36.0	37.7	42.2	40.8	41.9	39.0	37.5
7	47.0	43.5	41.1	40.0	36.6	36.2	37.6	41.0	40.9	42.5	39.1	38.0
8	43.1	44.6	40.6	39.8	36.5	36.6	37.5	40.3	41.1	41.8	38.8	37.8
9	44.5	42.0	40.8	39.8	36.5	36.9	37.5	40.4	41.3	40.8	38.5	37.6
10	43.2	43.9	40.1	39.7	36.5	36.8	38.2	40.0	42.0	40.3	38.3	37.4
11	41.8	49.3	39.7	39.0	36.5	37.0	38.1	39.6	43.7	40.1	38.3	37.4
12	40.4	44.4	39.4	38.8	36.5	36.8	37.9	39.4	46.4	40.3	38.2	37.3
13	39.7	42.4	39.1	38.8	36.5	36.6	37.7	39.4	47.6	40.8	38.1	39.2
14	39.3	41.3	38.9	38.8	36.7	36.5	37.5	39.4	47.5	41.6	37.9	40.1
15	39.2	40.5	38.8	38.8	36.6	36.5	37.4	39.5	46.4	42.2	39.8	39.5
16	39.4	40.1	38.9	38.2	36.5	36.8	37.4	40.1	45.8	43.0	37.6	40.7
17	41.0	39.6	38.9	38.0	36.4	37.1	37.5	41.3	44.6	43.0	37.7	39.5
18	42.1	39.4	38.7	38.1	36.5	37.3	37.5	41.1	43.7	42.6	37.9	38.5
19	40.4	39.3	38.5	38.4	36.5	37.5	37.7	41.2	43.0	41.9	38.0	37.9
20	39.6	41.0	38.5	38.0	36.4	37.7	37.6	40.8	42.4	41.4	38.4	37.6
21	39.1	50.7	38.6	37.8	36.3	38.2	37.7	40.4	42.1	40.9	38.9	37.8
22	38.8	50.6	38.4	37.5	36.3	38.4	38.1	40.8	41.9	40.3	38.0	38.1
23	38.5	46.1	39.8	37.5	36.3	38.9	38.3	40.8	42.2	39.8	37.9	38.8
24	38.6	43.9	42.5	37.5	36.2	39.7	38.7	40.3	41.4	40.1	37.9	37.7
25	47.8	42.4	40.5	37.5	36.2	39.7	40.3	40.2	41.0	40.6	37.8	37.4
26	44.0	41.6	39.8	37.3	36.1	39.0	40.2	40.2	41.5	40.9	37.8	37.2
27	41.5	40.6	39.8	37.2	36.1	38.6	39.6	40.0	44.3	40.3	37.6	37.0
28	40.4	40.3	39.4	37.2	36.0	38.3	39.3	40.1	42.9	39.7	37.6	36.8
29	39.7	39.9	39.1	37.1	....	38.0	39.1	40.6	41.9	39.7	37.5	36.7
30	39.3	39.6	39.3	37.0	....	37.9	39.2	41.7	41.1	39.7	37.5	36.6
31	39.0	....	39.2	36.9	....	38.1	....	43.4	....	39.5	38.1	....

Daily discharge, in second-feet, of Skagit River near Sedro Woolley, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	15,600	10,800	17,000	13,700	6,900	4,240	12,100	16,600	46,400	23,400	15,300	11,400
2	17,300	11,800	20,600	12,500	6,600	4,240	12,500	20,200	49,700	23,400	14,500	12,100
3	34,000	13,700	23,400	12,100	6,300	4,240	12,100	22,500	41,600	24,400	14,900	12,100
4	35,000	12,900	20,600	12,500	6,000	4,240	11,400	26,300	31,700	23,400	14,900	12,100
5	26,500	11,500	20,200	12,900	6,300	4,240	10,600	32,700	26,300	23,400	14,900	10,600
6	22,700	13,700	23,400	13,300	6,000	4,240	9,520	29,200	22,500	27,700	14,500	8,840
7	50,100	31,400	23,900	18,800	6,000	4,820	9,180	23,400	22,900	30,700	14,900	10,600
8	29,400	37,200	21,600	17,900	5,700	6,000	8,840	20,200	23,900	27,200	13,700	9,880
9	36,600	24,100	22,500	17,900	5,700	6,900	8,840	20,600	24,800	22,500	12,500	9,180
10	29,900	33,500	19,300	17,500	5,700	6,600	11,400	18,800	28,200	20,200	11,700	8,500
11	23,200	62,900	17,500	14,500	5,700	7,220	11,000	17,000	36,800	19,300	11,700	8,500
12	16,800	36,100	16,200	13,700	5,700	6,600	10,200	16,200	51,400	20,200	11,400	8,180
13	14,000	26,000	14,900	13,700	5,700	6,000	9,520	16,200	58,100	22,500	11,000	15,300
14	12,600	20,800	14,100	13,700	6,300	5,700	8,840	16,200	57,600	26,300	10,200	19,300
15	12,200	17,300	13,700	13,700	6,000	5,700	8,500	16,600	51,400	29,200	9,880	16,600
16	12,900	15,600	14,100	11,400	5,700	6,600	8,500	19,300	48,000	33,200	9,180	22,000
17	19,500	13,700	14,100	10,600	5,400	7,540	8,840	24,800	41,600	33,200	9,520	16,600
18	24,600	12,900	13,300	11,000	5,700	8,180	8,840	23,900	36,800	31,200	10,200	12,500
19	16,800	12,600	12,500	12,100	5,700	8,840	9,520	24,400	33,200	27,700	10,200	10,200
20	13,700	19,500	12,500	10,600	5,400	9,520	9,180	22,500	30,200	25,300	12,100	9,180
21	11,800	70,800	12,900	9,880	5,110	11,400	9,520	20,600	28,700	22,900	14,100	9,880
22	10,800	75,400	12,100	8,840	5,110	12,100	11,000	22,500	27,700	20,200	10,600	11,000
23	9,840	49,700	17,900	8,840	5,110	13,300	11,700	22,500	29,200	17,900	10,200	13,700
24	10,200	37,900	30,700	8,840	4,820	17,500	13,300	20,200	25,300	19,300	10,200	9,520
25	54,500	30,200	21,100	8,840	4,820	17,500	20,200	19,700	23,400	21,600	9,880	8,500
26	34,000	25,300	17,900	8,180	4,530	14,500	19,700	19,700	25,800	22,900	9,880	7,860
27	21,800	21,600	17,900	7,860	4,530	12,900	17,000	18,600	40,000	20,200	9,180	7,220
28	16,800	20,200	16,200	7,860	4,240	11,700	15,800	19,300	32,700	17,500	9,180	6,600
29	14,000	18,400	14,900	7,540	....	10,600	14,900	21,600	27,700	17,500	8,840	6,300
30	12,600	17,000	15,800	7,220	....	10,200	15,300	26,800	23,900	17,500	8,840	6,000
31	11,500	....	15,300	6,900	....	11,000	....	35,300	....	16,600	11,000	....

NOTE.—Discharge Oct. 1 to Nov. 21, 1910, determined from a rating curve well defined between 6,000 and 15,000 second-feet. Discharge Nov. 22, 1910, to Sept. 30, 1911, determined from a rating curve well defined above 4,000 second-feet. Discharge figures Oct. 1 to Dec. 31, 1910, supersede those published in Water Supply Paper 292, p. 626.

Monthly discharge of Skagit River near Sedro Woolley, Wash., for the year ending Sept. 30, 1911.

[Drainage area, 2,930 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	54,500	9,840	21,700	7.41	8.54	1,330,000	B.
November	75,400	10,800	26,800	9.15	10.21	1,590,000	B.
December	30,700	12,100	17,700	6.04	6.96	1,090,000	A.
January	18,800	6,900	11,800	4.03	4.65	726,000	A.
February	6,900	4,240	5,600	1.91	1.99	311,000	A.
March	17,500	4,240	8,530	2.91	3.36	524,000	A.
April	20,200	8,500	11,600	3.96	4.42	690,000	A.
May	35,300	16,200	21,800	7.44	8.58	1,340,000	A.
June	58,100	22,500	34,900	11.9	13.28	2,080,000	A.
July	33,200	16,600	23,500	8.02	9.25	1,440,000	A.
August	15,300	8,840	11,600	3.96	4.56	713,000	A.
September	22,000	6,000	11,000	3.75	4.18	655,000	A.
The year	75,400	4,240	17,300	5.90	79.98	12,500,000	

CASCADE RIVER NEAR MARBLEMOUNT, WASH.

Location.—At a proposed site for a dam and power plant, 8 miles above the mouth, and 8 miles above Marblemount.

Records available.—March 8, 1908, to September 30, 1911.

Drainage area.—222 square miles.

Gage.—Vertical staff on the right bank. Prior to May 25, 1909, two gages were used, the first from March 8, 1908, to March 31, 1909, being situated 500 feet below the present gage, and the second from April 1 to May 24, 1909, being situated about 6 miles below the present gage and set to read the same as the first.

Channel.—Gravel and cobblestones; shifting in extreme floods.

Discharge measurements.—Made from a cable 100 feet below the gage.

Accuracy.—Results good.

Discharge measurements of Cascade River near Marblemount, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Dec. 31	Freeman and Gilkey	1.87	556	Mar. 6	H. P. Gilkey	0.80	197
				16	Ebert and Gilkey	1.05	275

Daily gage height, in feet, of Cascade River near Marblemount, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	4.52	2.60	2.32	1.8	1.35	1.0	1.95	2.65	5.6	3.4	2.8	2.75
2	2.78	2.38	2.92	1.75	1.25	1.0	1.8	2.8	5.3	3.5	2.9	2.85
3	6.00	2.29	2.70	1.7	1.2	1.0	1.6	2.7	3.8	3.5	3.0	3.0
4	3.85	2.18	2.50	1.8	1.2	1.0	1.55	3.1	3.2	3.3	3.1	2.6
5	3.52	2.05	2.30	1.75	1.2	1.05	1.45	3.2	2.8	3.9	3.0	2.3
6	6.50	2.65	2.42	1.8	1.2	.9	1.4	2.85	2.7	4.4	3.2	2.3
7	4.95	5.30	2.40	2.2	1.2	.85	1.3	2.55	3.1	4.1	2.7	2.2
8	4.85	3.35	2.38	2.0	1.15	.9	1.3	2.5	3.2	3.5	2.55	2.1
9	5.25	3.38	2.34	2.1	1.2	.9	1.6	2.35	3.5	3.1	2.45	2.15
10	3.70	7.70	2.32	1.75	1.2	.9	1.6	2.2	3.8	2.85	2.5	2.2
11	3.15	4.50	2.12	1.55	1.15	.9	1.5	2.13	5.0	3.0	2.45	2.15
12	3.00	3.60	2.08	1.4	1.05	.9	1.4	2.15	6.6	3.5	2.4	2.4
13	2.90	3.13	2.00	1.5	1.05	.88	1.3	2.25	6.4	4.1	2.35	3.2
14	3.05	2.75	1.99	1.4	1.05	.9	1.3	2.25	5.8	4.4	2.3	3.1
15	2.80	2.58	2.10	1.4	1.05	.95	1.26	2.5	5.3	4.7	2.25	3.3
16	3.05	2.40	2.00	1.4	1.05	1.1	1.35	3.3	4.8	5.0	2.3	3.0
17	5.00	2.25	1.97	1.5	1.0	1.2	1.3	2.95	4.4	4.8	2.5	2.25
18	3.15	2.15	1.92	1.55	1.0	1.3	1.35	2.85	4.0	4.4	2.6	1.95
19	2.78	2.08	1.84	1.5	1.0	1.4	1.35	2.7	3.8	4.0	2.4	1.65
20	2.45	5.15	1.92	1.5	1.0	1.65	1.35	2.5	3.7	3.9	3.0	1.55
21	2.25	7.95	1.86	1.5	1.0	1.8	1.5	2.75	3.6	3.5	2.45	2.5
22	2.12	4.75	1.84	1.4	1.0	1.9	1.6	2.95	4.2	3.1	2.35	2.0
23	2.00	4.10	2.58	1.5	1.0	2.35	1.75	2.6	3.5	3.4	2.5	1.9
24	5.65	3.35	2.68	1.5	1.0	2.3	2.4	2.5	3.2	3.8	2.45	1.85
25	7.10	3.00	2.32	1.5	1.0	2.0	2.75	2.55	3.6	4.0	2.35	1.7
26	3.50	2.80	2.20	1.4	1.0	1.85	2.35	2.45	4.8	3.6	2.3	1.15
27	3.00	2.58	2.10	1.4	1.0	1.65	2.2	2.5	4.5	3.2	2.3	1.3
28	2.75	2.40	2.02	1.4	1.0	1.5	2.15	2.85	3.8	3.2	2.2	1.2
29	2.45	2.30	1.99	1.35	......	1.5	2.15	3.2	3.4	3.3	2.05	1.3
30	2.30	2.22	1.98	1.35	......	1.65	2.4	4.1	3.3	3.2	2.7	1.2
31	2.20	......	1.90	1.33	......	1.9	......	5.4	......	2.9	2.65	......

Daily discharge, in second-feet, of Cascade River near Marblemount, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	3,480	1,130	896	535	350	250	615	1,140	5,350	1,970	1,290	1,240
2	1,300	944	1,440	512	320	250	535	1,290	4,780	2,100	1,390	1,340
3	6,170	872	1,220	490	305	250	445	1,190	2,490	2,100	1,490	1,490
4	2,560	786	1,040	535	305	250	425	1,600	1,720	1,840	1,600	1,100
5	2,130	700	880	512	305	262	385	1,720	1,290	2,620	1,490	860
6	7,260	1,180	966	535	305	225	365	1,340	1,190	3,300	1,720	860
7	4,160	4,780	960	780	305	212	335	1,060	1,600	2,880	1,190	780
8	4,000	1,920	944	645	290	225	335	1,020	1,720	2,100	1,060	710
9	4,690	1,960	912	710	305	225	445	900	2,100	1,600	980	745
10	2,360	10,200	896	512	305	225	445	780	2,490	1,340	1,020	780
11	1,680	3,450	744	425	290	225	405	731	4,250	1,490	980	745
12	1,520	2,230	718	365	262	225	365	745	7,500	2,100	940	940
13	1,420	1,660	670	405	262	220	335	820	7,040	2,880	900	1,720
14	1,580	1,270	610	365	262	225	335	820	5,750	3,300	860	1,600
15	1,320	1,110	730	365	262	238	323	1,020	4,780	3,760	820	1,840
16	1,580	960	670	365	262	275	350	1,840	3,920	4,250	860	1,490
17	4,250	840	652	405	250	305	335	1,440	3,300	3,920	1,020	820
18	1,680	765	622	425	250	335	350	1,340	2,750	3,300	1,100	615
19	1,300	718	580	405	250	365	350	1,190	2,490	2,750	940	468
20	1,000	4,510	622	405	250	468	350	1,020	2,360	2,620	1,490	425
21	840	10,800	590	405	250	535	405	1,240	2,230	2,100	980	1,020
22	744	3,840	580	365	250	585	445	1,440	3,020	1,600	900	645
23	670	2,880	1,110	405	250	900	512	1,100	2,100	1,970	1,020	585
24	5,450	1,920	1,200	405	250	860	940	1,020	1,720	2,490	980	560
25	8,700	1,520	896	405	250	645	1,240	1,060	2,230	2,750	900	490
26	2,100	1,320	800	365	250	560	900	980	3,920	2,230	860	290
27	1,520	1,110	730	365	250	468	780	1,020	3,450	1,720	860	335
28	1,270	960	682	365	250	405	745	1,340	2,490	1,720	780	305
29	1,000	880	664	350	......	405	745	1,720	1,970	1,840	678	335
30	880	816	658	350	......	468	940	2,880	1,840	1,720	1,190	305
31	800	......	610	344	......	585	......	4,960	......	1,390	1,140	......

NOTE.—Discharge determined from a rating curve well defined between 200 and 3,000 second-feet.

Monthly discharge of Cascade River near Marblemount, Wash., for the year ending Sept. 30, 1911.

[Drainage area, 222 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	8,700	670	2,560	11.5	13.26	157,000	A.
November	10,800	700	2,270	10.2	11.38	135,000	A.
December	1,440	580	816	3.68	4.24	50,200	A.
January	780	344	446	2.01	2.32	27,400	A.
February	350	250	275	1.24	1.29	15,300	A.
March	900	212	376	1.69	1.95	23,100	A.
April	1,240	323	516	2.32	2.59	30,700	A.
May	4,960	731	1,350	6.08	7.01	83,000	A.
June	7,500	1,190	3,130	14.1	15.73	186,000	A.
July	4,250	1,340	2,380	10.7	12.34	146,000	A.
August	1,720	678	1,080	4.86	5.60	66,400	A.
September	1,840	290	848	3.82	4.26	50,500	A.
The year	10,800	212	1,340	6.04	81.97	971,000	

SAUK RIVER ABOVE CLEAR CREEK, NEAR DARRINGTON, WASH.

Location.—In sec. 31, T. 32 N., R. 10 E., just above Clear Creek, 1 mile below Cougar Creek, 2 miles below Goodman Creek, 7 miles below Whitechuck Creek, 10 miles above Suiattle Creek, and about 2½ miles above Darrington.

Records available.—August 28, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Inclined staff on left bank.

Channel.—Rocks and gravel; shifting in floods.

Discharge measurements.—Made from a cable 300 feet above the gage.

Accuracy.—Results good, except for periods when no observer was available.

Discharge measurements of Sauk River above Clear Creek, near Darrington, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 18	Kimble and Gilkey	1.93	2,400	Mar. 1	H. P. Gilkey	0.57	410
Dec. 17	H. P. Gilkey	1.35	1,170	Apr. 18	do	1.14	891
				May 26	do	1.83	2,040
1911.				June 16	do	2.92	5,600
Jan. 4	H. P. Gilkey	1.30	1,150	Aug. 3	do	2.15	2,660
Feb. 8	do	.72	518	Sept. 2	W. W. Clifford	1.12	846
19	do	.67	462				

Daily gage height, in feet, of Sauk River above Clear Creek, near Darrington, Wash., for the year ending Sept. 30, 1911.

[E. G. Muir and Charles Backman, observers.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.60	1.30	......	1.4	1.1	0.6	1.5	1.8	3.0	2.0	1.5	1.6
2	1.60	1.30	......	1.4	1.1	.6	1.4	2.0	2.9	2.0	1.5	1.3
3	4.50	1.60	......	1.3	1.1	.6	1.3	2.2	2.5	2.1	1.5	1.2
4	2.95	......	......	1.4	1.1	.6	1.3	2.5	2.2	2.1	1.5	1.1
5	2.45	......	......	1.8	1.1	.6	1.2	2.3	2.1	2.2	1.5	1.0
6	2.70	......	......	2.1	1.1	.6	1.2	2.1	2.1	2.4	......	......
7	3.00	3.00	......	2.3	1.0	.8	1.2	1.9	2.1	2.2	1.3	1.1
8	2.70	......	......	2.2	1.0	1.1	1.2	1.8	2.1	2.0	1.3	1.1
9	2.40	......	......	2.4	1.0	.9	1.3	1.9	2.2	1.9	1.2	1.2
10	1.95	4.60	......	2.2	1.0	.8	1.3	2.0	2.4	1.8	1.2	1.0
11	1.75	......	......	2.0	1.0	.8	1.3	1.7	3.3	1.9	1.3	1.1
12	1.60	......	......	1.9	1.0	.8	1.2	1.8	3.5	2.0	1.4	1.1
13	1.50	......	......	1.6	1.0	.8	1.1	1.8	3.3	2.2	......	1.7
14	1.40	2.00	......	1.3	......	.8	1.1	1.7	3.0	2.4	1.1	1.5
15	1.40	1.90	......	1.1	......	.8	1.1	1.9	2.9	2.7	1.1	1.8
16	1.35	1.80	......	1.1	......	.9	1.1	2.2	2.9	2.5	......	1.8
17	2.00	1.58	1.35	1.3	......	1.1	1.1	2.0	2.6	2.4	1.2	......
18	1.95	1.50	1.20	1.5	......	1.1	1.2	2.2	2.4	2.3	1.2	......
19	1.65	......	1.40	1.5	.7	1.1	1.1	2.1	2.3	2.1	1.2	......
20	1.50	......	1.70	1.4	......	1.3	1.1	2.0	2.2	2.0	1.2	......
21	1.40	5.50	1.80	1.2	......	1.4	1.2	2.1	2.3	1.8	1.2	1.5
22	1.30	......	1.80	1.1	......	1.4	1.3	2.0	2.4	1.7	......	1.2
23	1.20	2.90	4.60	1.1	......	1.8	1.8	2.2	2.2	1.9	1.1	1.2
24	......	2.50	3.3	1.1	......	1.9	1.9	1.7	2.0	1.9	1.1	1.1
25	......	......	2.90	1.1	......	1.6	1.9	1.8	2.0	2.0	1.0	......
26	......	......	2.85	1.1	......	1.5	1.7	1.9	2.9	1.8	1.0	.9
27	1.80	......	2.90	1.1	......	1.3	1.6	1.9	2.4	1.6	......	......
28	1.60	......	2.60	1.1	......	1.3	1.6	2.0	2.2	1.6	1.2	......
29	......	......	2.60	1.1	......	1.3	1.7	2.3	2.1	1.6	1.0	......
30	......	......	2.60	1.1	......	1.3	1.8	2.5	2.1	1.6	......	......
31	1.30	......	2.10	1.1	......	1.3	......	3.0	......	1.5	1.3	......

Daily discharge, in second-feet, of Sauk River above Clear Creek, near Darrington, Wash., for Aug. 28, 1910, to Sept. 30, 1911.

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	600	4,480	1,250	......	1,270	880	420	1,420	1,960	6,050	2,300	1,310	1,470
2	......	600	1,730	1,250	......	1,270	880	420	1,270	2,400	5,580	2,300	1,310	1,020
3	......	576	15,200	1,730	......	1,130	880	420	1,130	2,930	3,930	2,560	1,310	890
4	......	560	5,910	1,800	......	1,270	880	420	1,130	3,930	2,930	2,560	1,310	780
5	......	546	3,940	2,000	......	1,960	880	420	1,000	3,240	2,650	2,840	1,310	680
6	......	490	4,870	3,000	......	2,650	880	420	1,000	2,650	2,650	3,470	1,160	730
7	......	490	6,130	6,130	......	3,240	770	585	1,000	2,170	2,650	2,840	1,020	780
8	......	545	4,870	5,000	......	2,930	770	880	1,000	1,960	2,650	2,300	1,020	780
9	......	600	3,760	5,000	......	3,570	770	675	1,130	2,170	2,930	2,060	890	890
10	......	656	2,480	16,000	......	2,930	770	585	1,130	2,400	3,570	1,850	890	680
11	......	402	2,040	8,000	......	2,400	770	585	1,130	1,770	7,540	2,060	1,020	780
12	......	394	1,730	6,000	......	2,170	770	585	1,000	1,960	8,610	2,300	1,160	780
13	......	386	1,550	4,000	......	1,590	770	585	880	1,960	7,520	2,840	970	1,650
14	......	386	1,390	2,600	......	1,130	725	585	880	1,770	5,970	3,470	780	1,310
15	......	430	1,390	2,360	......	880	680	585	880	2,170	5,490	4,600	780	1,850
16	......	490	1,320	2,140	......	880	635	675	880	2,930	5,490	3,820	835	1,850
17	......	506	2,600	1,690	1,200	1,130	590	880	880	2,400	4,200	3,470	890	1,400
18	......	524	2,480	1,550	1,000	1,420	545	880	1,000	2,930	3,470	3,140	890	1,200
19	......	542	1,830	1,500	1,270	1,420	500	880	880	2,650	3,140	2,560	890	1,000
20	......	560	1,550	8,000	1,770	1,270	492	1,130	880	2,400	2,840	2,300	890	800
21	......	640	1,390	22,600	1,960	1,000	484	1,270	1,000	2,650	3,140	1,850	890	1,310
22	......	600	1,250	9,000	1,960	880	476	1,270	1,130	2,400	3,470	1,650	835	890
23	......	560	1,120	5,580	16,000	880	468	1,960	1,960	2,930	2,840	2,060	780	890
24	......	504	1,100	3,930	7,540	880	460	2,170	2,170	1,770	2,300	2,060	780	780
25	......	460	4,000	3,000	5,580	880	452	1,590	2,170	1,960	2,300	2,300	680	685
26	......	418	8,000	2,400	5,360	880	444	1,420	1,770	2,170	5,490	1,850	680	590
27	......	460	2,140	2,100	5,580	880	436	1,130	1,590	2,170	3,470	1,470	785	550
28	490	503	1,730	1,800	4,310	880	428	1,130	1,590	2,400	2,840	1,470	890	510
29	490	546	1,570	1,500	4,310	880	......	1,130	1,770	3,240	2,560	1,470	680	480
30	460	720	1,410	1,200	4,310	880	......	1,130	1,960	3,930	2,560	1,470	850	450
31	600	......	1,250	......	2,650	880	......	1,130	......	6,050	......	1,310	1,020	......

NOTE.—Discharge determined as follows: Aug. 28 to Nov. 21, 1910, from a fairly well defined rating curve Nov. 22, 1910, to June 12, 1911, from a rating curve well defined below 7,500 second-feet; June 13 to Sept. 30, 1911, from a rating curve well defined between 900 and 6,000 second-feet; Dec. 1 to 16, 1910, estimated at 1,500 second-feet by comparison with records on adjacent streams. Discharge for days in October and November, 1910, and in September, 1911, estimated by comparison with records on adjacent streams. Discharge interpolated for all other days for which no gage height was reported.

Monthly discharge of Sauk River above Clear Creek, near Darrington, Wash., for 1910–11.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1910.					
September	720	386	523	31,100	B.
The period				31,100	
1910–11.					
October	15,200	1,100	3,100	191,000	B.
November	22,600	1,200	4,470	266,000	D.
December	16,000	1,000	2,860	176,000	D.
January	3,570	880	1,490	91,600	A.
February	880	428	660	36,700	B.
March	2,170	420	901	55,400	A.
April	2,170	880	1,250	74,400	A.
May	6,050	1,770	2,590	159,000	A.
June	8,610	2,300	4,030	240,000	A.
July	4,600	1,310	2,410	148,000	A.
August	1,310	680	952	58,500	B.
September	1,850	450	948	56,400	C.
The year	22,600	420	2,140	1,550,000	

SAUK RIVER NEAR SUIATTLE CROSSING, NEAR SAUK, WASH.

Location.—In sec. 13, T. 34 N., R. 9 E., 4 miles above Sauk, 6 miles below Suiattle crossing, and about 8 miles below Suiattle River.

Records available.—August 27, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Cantilever chain. Prior to March 3, 1911, several gages in the vicinity of Suiattle crossing, 6 miles above the present gage.

Channel.—Gravel; shifting in floods.

Discharge measurements.—Made from a cable at Suiattle Crossing, 6 miles above gage.

Accuracy.—Results good.

Discharge measurements of Sauk River near Suiattle Crossing, near Sauk, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
1910.			
Oct. 16	Kimble and Gilkey	[b] 3.08	3,240
Nov. 8[a]	H. P. Gilkey	[b] 6.78	11,300
1911.			
Jan. 2	H. P. Gilkey	[b] 2.66	2,770
Mar. 4	.....do	[c] 1.37	1,100
Apr. 21	H. P. Gilkey	2.07	2,520
May 24	.....do	2.72	4,300
June 15	.....do	4.98	12,100
July 2	.....do	3.32	5,960
Sept. 10	W. W. Clifford	1.92	1,900

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[a] Measurements incomplete. Computed by comparison with velocities obtained later.
[b] Measurement referred to upper gage.
[c] Upper gage read 1.22 feet.

Daily gage height, in feet, of Sauk River near Suiattle Crossing, near Sauk, Wash., for the year ending Sept. 30, 1911.

[Mrs. E. H. Miller, observer.]

Day.	Oct.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1			2.4	2.7	5.3	3.2	2.4	2.1
2			2.3	3.1	4.7	3.3	2.5	2.1
3		1.4	2.2	3.2	3.9	3.4	2.3	2.2
4		1.4	2.1	3.8	3.4	3.2	2.3	2.0
5		1.4	2.0	3.7	3.1	3.6	2.4	1.9
6	5.3	1.4	1.9	3.3	2.9	3.9	2.3	2.4
7	4.7	1.5	2.0	2.9	3.0	3.8	2.2	2.1
8	4.5	1.7	2.1	3.0	3.2	3.5	2.2	1.9
9	4.2	1.7	2.1	3.0	3.5	3.0	2.2	1.8
10	3.8	1.8	1.9	2.7	3.7	2.9	2.1	1.9
11	3.6	1.7	1.8	2.6	4.9	3.0	2.0	1.9
12	3.2	1.6	1.7	2.6	5.9	3.1	2.1	1.9
13	3.1	1.5	1.8	2.8	5.5	3.5	2.0	2.9
14	3.2	1.5	1.8	2.6	5.5	3.7	2.0	2.5
15	3.1	1.6	1.9	2.8	4.7	4.0	2.0	3.0
16	4.4	1.8	1.9	3.6	4.5	4.0	1.8	3.0
17	4.0	1.9	1.8	3.2	4.4	3.8	2.0	2.5
18	3.8	2.0	1.9	3.4	3.9	3.6	1.9	2.2
19	3.2	2.0	1.9	3.1	3.8	3.3	2.1	1.9
20	3.0	2.2	2.1	2.9	3.7	3.4	2.3	1.9
21		2.4	1.9	3.0	3.6	3.0	2.1	2.3
22		2.9	2.0	3.2	3.9	2.7	1.9	2.2
23		3.0	2.2	3.2	3.5	2.8	2.0	2.0
24	3.5	3.0	2.4	2.9	3.3	3.0	2.0	1.8
25		2.8	3.0	2.8	3.3	3.1	1.8	1.7
26		2.4	2.6	2.8	3.8	2.8	1.9	1.7
27		2.1	2.5	2.8	4.6	2.6	1.9	1.7
28		2.0	2.5	2.9	3.8	2.5	2.0	1.6
29		2.2	2.5	3.3	3.4	2.5	2.0	1.6
30		2.2	2.5	3.8	3.3	2.5	2.2	1.5
31		2.3		4.5		2.5	2.1	

Daily discharge, in second-feet, of Sauk River near Suiattle Crossing, near Sauk, Wash., for Aug. 27, 1910, to Sept. 30, 1911.

Day.	Aug.	Sept.	Oct.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1					3,380	4,230	13,400	5,560	3,170	2,360
2					3,110	5,440	11,000	5,890	3,450	2,360
3				1,160	2,850	5,760	8,110	6,230	2,900	2,630
4				1,160	2,590	7,760	6,410	5,560	2,900	2,100
5				1,160	2,340	7,420	5,440	6,920	3,170	1,850
6		1,430	7,740	1,160	2,100	6,080	4,820	7,990	2,900	3,170
7		1,340	6,390	1,320	2,340	4,820	5,130	7,630	2,630	2,360
8		1,300	5,970	1,680	2,590	5,130	5,760	6,570	2,630	1,850
9		1,200	5,360	1,680	2,590	5,130	6,740	4,920	2,630	1,620
10		1,160	4,570	1,880	2,100	4,230	7,420	4,610	2,360	1,850
11		1,160	4,200	1,680	1,880	3,940	11,800	4,920	2,100	1,850
12		1,120	3,500	1,490	1,680	3,940	15,900	5,240	2,360	1,850
13		1,160	3,340	1,320	1,880	4,520	14,200	6,570	2,100	4,610
14		1,250	3,500	1,320	1,880	3,940	14,200	7,270	2,100	3,450
15		1,250	3,340	1,490	2,100	4,520	11,000	8,350	2,100	4,920
16		1,480	5,760	1,880	2,100	7,080	10,200	8,350	1,620	4,920
17			4,960	2,100	1.880	5,760	9,830	7,630	2,100	3,450
18			4,570	2,340	2,100	6,410	7,990	6,920	1,850	2,630
19			3,500	2,340	2,100	5,440	7,630	5,890	2,360	1,850
20			3,180	2,850	2,590	4,820	7,270	6,230	2,900	1,850
21		1,630		3,380	2,100	5,130	6,920	4,920	2,360	2,900
22		1,630		4,820	2,340	5,760	7,990	4,020	1,850	2,630
23		1,580		5,130	2,850	5,760	6,570	4,310	2,100	2,100
24		1,580	4,020	5,130	3,380	4,820	5,890	4,920	2,100	1,620
25		1,300		4,520	5,130	4,520	5,890	5,240	1,620	1,410
26		1,250		3,380	3,940	4,520	7,630	4,310	1,850	1,410
27	1,430	1,200		2,590	3,660	4,520	10,600	3,730	1,850	1,410
28		1,160		2,340	3,660	4,820	7,630	3,450	2,100	1,220
29		1,340		2,850	3,660	6,080	6,230	3,450	2,100	1,220
30		1,730		2,850	3,660	7,760	5,890	3,450	2,630	1,050
31				3,110		10,300		3,450	2,360	

NOTE.—Discharge for August, September, and October, 1910, determined from a fairly well-defined rating curve. Discharge Mar. 3 to June 12, 1911, determined from a well-defined rating curve. Discharge June 13 to Sept. 30, 1911, determined from a rating curve well defined between 1,400 and 18,000 second-feet.

Monthly discharge of Sauk River near Suiattle Crossing, near Sauk, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
March 3-31	5,130	1,160	2,420	139,000	A.
April	5,130	1,680	2,690	160,000	A.
May	10,300	3,940	5,500	338,000	A.
June	15,900	4,820	8,520	507,000	A.
July	8,350	3,450	5,630	346,000	A.
August	3,450	1,620	2,360	145,000	A.
September	4,920	1,050	2,350	140,000	A.
The period				1,780,000	

CLEAR CREEK NEAR DARRINGTON, WASH.

Location.—In sec. 31, T. 32 N., R. 10 E., at the ranger station just above the mouth of the creek, and 2½ miles above Darrington.

Records available.—August 28, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on left bank.

Channel.—Gravel; shifting in floods.

Discharge measurements.—Made from wagon bridge at gage.

Accuracy.—Results poor on account of backwater from Sauk River.

Discharge measurements of Clear Creek near Darrington, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 7	H. P. Gilkey	4.30	673	Feb. 19	H. P. Gilkey	1.02	74.5
18	do	3.20	510	Mar. 1	do	.87	47.9
Nov. 10	do	7.48	4,080	Apr. 18	do	1.81	230
Dec. 17	do	1.85	244	May 26	do	2.30	281
				June 16	do	3.62	364
1911.				Aug. 3	W. W. Clifford	2.54	209
Jan. 4	H. P. Gilkey	1.59	167	Sept. 2	do	.78	20.0
Feb. 8	do	.98	64.4				

Daily gage height, in feet, of Clear Creek near Darrington, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	4.0	2.0	......	1.9	1.0	0.9	2.0	2.7	4.1	2.3	1.4	0.8
2	2.6	1.8	......	1.4	1.0	.9	1.8	3.0	3.7	2.4	1.4	.9
3	6.7	3.2	......	1.4	1.0	1.0	1.6	3.5	2.9	2.4	1.3	.9
4	4.95	......	......	1.6	1.0	1.0	1.6	4.0	2.5	2.4	1.3	.9
5	4.25	......	......	2.0	1.0	1.0	1.5	3.6	2.4	2.5	1.3	.8
6	4.1	......	......	2.2	1.0	1.1	1.4	3.0	2.4	3.1	1.2	......
7	4.4	5.8	......	2.6	1.0	1.4	1.4	2.5	2.5	2.7	1.1	1.0
8	4.0	......	......	1.9	1.0	1.6	1.4	2.6	2.5	2.3	1.1	1.0
9	3.8	......	......	2.2	1.0	1.4	2.0	2.6	2.6	2.0	1.0	1.0
10	2.95	7.45	......	2.0	1.0	1.4	1.9	1.8	3.4	2.0	1.0	.9
11	2.45	......	......	1.6	1.0	1.4	1.8	2.3	4.4	2.5	1.1	.9
12	2.15	......	......	1.6	1.0	1.2	1.7	2.3	4.7	2.5	1.1	.9
13	2.0	......	1.7	1.6	1.0	1.2	1.5	2.3	4.4	2.9	......	3.3
14	1.8	2.6	......	1.3	1.0	1.2	1.5	2.3	4.1	3.0	.9	2.2
15	1.8	2.35	......	1.0	1.0	1.4	1.6	2.7	3.9	3.4	.9	2.9
16	1.65	2.1	......	1.0	1.0	1.7	1.6	2.9	3.5	3.3	......	3.1
17	4.5	1.9	1.85	1.4	......	1.8	1.6	2.7	3.5	3.0	.9	......
18	3.0	1.8	1.6	1.8	......	1.8	1.8	2.9	3.5	2.8	.9	......
19	2.35	......	1.8	1.8	1.0	1.8	1.7	2.8	2.9	2.3	.9	......
20	2.05	7.0	1.9	1.4	......	2.1	1.9	2.5	2.8	2.3	1.5	......
21	1.85	8.3	1.9	1.0	......	2.1	2.0	2.8	2.8	1.9	1.3	1.8
22	1.7	......	1.85	1.0	......	2.2	2.0	2.5	2.9	1.7	......	1.8
23	1.6	4.2	5.1	1.0	......	2.9	3.0	2.6	2.5	1.9	1.0	1.6
24	......	3.2	3.2	1.0	......	3.2	2.7	2.2	2.3	1.9	.9	1.4
25	6.5	......	2.7	1.0	......	2.3	2.7	2.4	2.4	2.2	.8	......
26	......	......	2.75	1.0	......	1.9	2.6	2.5	4.0	1.8	.8	1.2
27	2.4	......	2.9	1.0	......	1.8	2.0	2.5	3.2	1.6	......	......
28	2.1	......	2.6	1.0	......	1.8	2.0	2.5	2.7	1.7	.8	......
29	......	......	2.55	1.0	......	1.9	2.4	3.1	2.4	1.7	.7	......
30	......	......	2.8	1.0	......	1.7	2.7	3.4	2.4	1.5	......	......
31	1.6	......	2.05	1.0	......	1.7	......	4.1	......	1.5	.8	......

NOTE.—Gage heights Oct. 1 to 31, 1910, and Apr. 25 to Aug. 20, 1911, affected by backwater from Sauk River.

Daily discharge, in second-feet, of Clear Creek near Darrington, Wash., for the year ending Sept. 30, 1910.

Day.	Aug.	Sept.	Day.	Aug.	Sept.	Day.	Aug.	Sept.
1	......	34	11	......	4	21	......	16
2	......	24	12	......	7	22	......	14
3	......	16	13	......	10	23	......	13
4	......	16	14	......	7	24	......	10
5	......	16	15	......	10	25	......	10
6	......	16	16	......	10	26	......	10
7	......	16	17	......	10	27	......	43
8	......	25	18	......	11	28	16	77
9	......	34	19	......	12	29	16	110
10	......	46	20	......	13	30	13	194
						31	34	......

Daily discharge, in second-feet, of Clear Creek near Darrington, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	860	248	....	220	46	34	248	400	915	53	7	42
2	148	194	....	110	46	34	194	510	675	68	7	53
3	2,150	700	....	110	46	46	148	750	336	68	4	53
4	970	....	....	148	46	46	148	1,000	194	68	4	53
5	600	....	....	248	46	46	128	778	159	84	7	42
6	555	....	....	306	46	60	110	490	148	207	4	54
7	700	2,480	....	435	46	110	110	321	148	119	3	65
8	555	....	....	220	46	148	110	352	138	53	2	65
9	490	....	....	306	46	110	248	352	148	20	3	65
10	234	4,050	....	248	46	110	220	138	336	24	4	53
11	128	....	....	148	46	110	194	262	725	92	13	53
12	92	....	....	148	46	76	170	262	860	92	16	53
13	76	....	170	148	46	76	128	262	675	182	13	760
14	53	435	....	92	46	76	128	262	532	207	10	237
15	60	352	....	46	46	110	148	384	435	336	13	578
16	46	276	....	46	46	170	148	452	306	306	16	665
17	1,090	220	207	110	46	194	148	384	306	220	20	577
18	400	194	148	194	46	194	194	452	306	170	24	489
19	220	....	194	194	46	194	170	418	148	84	29	401
20	159	3,600	220	110	45	276	220	321	128	84	155	313
21	128	4,900	220	46	44	276	248	418	128	29	113	225
22	110	....	207	46	43	306	248	321	148	16	89	225
23	92	1,280	1,920	46	42	555	600	352	76	34	65	177
24	1,510	700	700	46	40	700	470	234	46	34	53	133
25	2,930	....	470	46	39	336	470	291	60	84	42	114
26	1,630	....	490	46	38	220	418	321	470	29	42	95
27	336	....	555	46	36	194	220	306	220	16	42	90
28	248	....	435	46	35	194	207	306	119	24	42	85
29	281	....	418	46	....	220	321	490	68	24	31	80
30	314	....	510	46	....	170	400	600	68	10	37	75
31	148	....	262	46	....	170	....	942	....	10	42	....

NOTE.—Discharge determined from two fairly well defined rating curves. Gage heights Oct. 1 to 31, 1910, and Apr. 25 to Aug. 20, 1911, reduced before applying the unaffected rating curve. Discharge interpolated for days for which no gage heights were reported.

Monthly discharge of Clear Creek near Darrington, Wash., for 1910–11.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
1910.				
September	194	7	27.8	1,650
1910–11.				
October	2,930	46	558	34,300
November	....	....	....	....
December	....	....	....	....
January	435	46	132	8,120
February	46	35	44.1	2,450
March	700	34	179	11,000
April	600	110	230	13,700
May	1,000	138	424	26,100
June	915	46	301	17,900
July	336	10	91.8	5,640
August	155	2	30.7	1,890
September	760	42	199	11,800

BAKER LAKE NEAR CONCRETE, WASH.

Location.—At the fish hatchery on Baker Lake, 17½ miles above Concrete.

Records available.—October 2, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff in two sections.

Cooperation.—Gage heights furnished by the United States Bureau of Fisheries.

Daily gage height, in feet, of Baker Lake near Concrete, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	....	1.95	2.1	1.7	....	2.1	3.2	6.5	4.0	3.3	3.0
2	3.95	2.2	2.6	1.5	....	2.2	3.7	6.3	4.35	3.4	3.0
3	6.7	2.3	3.1	1.5	....	2.1	4.0	4.9	4.35	3.5	3.3
4	5.2	2.45	3.0	1.4	....	1.9	4.4	3.5	4.35	3.6	3.4
5	4.4	2.2	2.8	1.5	....	1.7	5.0	3.35	4.4	3.6	3.0
6	7.7	2.8	2.9	1.6	....	1.6	4.75	3.1	5.3	4.3	2.8
7	7.8	7.25	3.1	2.0	0.7	1.5	3.6	3.2	5.1	3.8	3.2
8	4.9	6.5	3.05	2.1	.8	1.4	3.3	3.5	4.8	3.5	3.3
9	6.5	5.2	2.9	2.1	1.0	1.6	3.1	3.85	4.2	3.3	2.9
10	5.15	9.1	2.6	2.0	1.1	1.8	2.9	4.9	3.7	3.1	2.6
11	3.9	7.5	2.3	1.8	1.1	1.85	2.7	6.1	3.8	3.2	2.6
12	3.15	4.7	2.15	....	1.0	1.8	2.6	6.9	4.0	3.1	2.6
13	2.8	3.7	2.0	....	.95	1.6	2.55	7.2	4.7	2.9	4.1
14	2.6	3.2	1.8	....	.8	1.5	2.6	6.7	5.3	2.8	5.1
15	2.5	2.7	1.7	....	.8	1.45	2.8	6.2	5.6	2.7	6.2
16	2.7	2.4	1.7	....	1.1	1.5	3.7	6.2	6.0	2.6	5.7
17	3.5	2.3	1.8	....	1.2	1.55	4.05	5.05	5.7	2.7	4.4
18	5.2	2.1	1.7	....	1.4	1.55	3.9	4.6	5.4	2.9	3.6
19	3.95	3.5	1.65	....	1.6	1.75	3.9	4.3	5.0	3.0	2.9
20	3.2	3.6	1.75	....	1.95	1.75	3.5	4.0	4.7	3.2	2.7
21	2.75	11.1	1.9	....	2.2	1.85	3.45	4.1	4.3	3.3	3.5
22	2.45	6.6	1.8	....	2.35	2.1	3.5	4.2	3.8	3.0	3.4
23	2.3	4.9	2.1	....	2.6	2.3	3.6	4.1	3.95	3.0	3.3
24	4.8	3.8	3.95	....	3.2	2.9	3.3	3.6	4.4	2.9	2.9
25	9.0	3.2	3.1	....	2.95	4.0	3.3	3.4	4.8	2.9	2.6
26	4.7	2.75	2.8	....	2.4	3.65	3.1	4.2	4.4	2.8	2.4
27	3.65	2.4	2.5	....	2.2	3.1	3.2	6.6	4.0	2.8	2.2
28	2.9	2.2	2.2	....	1.9	2.8	3.2	5.1	3.85	2.7	2.1
29	2.4	2.0	2.0	....	1.75	2.7	3.8	4.4	3.9	2.6	1.9
30	2.3	2.0	2.0	....	1.75	2.85	4.7	4.0	3.8	2.7	1.9
31	2.0	....	1.9	....	1.95	....	5.7	....	3.6	2.9	....

BAKER RIVER BELOW ANDERSON CREEK, NEAR CONCRETE, WASH.

Location.—In the SE. ¼ sec. 30, T. 37 N., R. 9 E., 100 feet below Anderson Creek, one-fourth mile above the Baker River ranger station, and 11 miles above Concrete.

Records available.—September 10, 1910, to September 30, 1911.

Drainage area.—184 square miles.

Gage.—Inclined staff on left bank since December 9, 1910. September 10 to November 19, 1910, vertical staff at trail bridge one-eighth mile above Anderson Creek. October 22 to November 19, 1910, a vertical staff at same location as present gage but with datum 4.1 feet higher.

Channel.—Gravel; shifting in floods.

Discharge measurements.—Made from a cable 300 feet above the gage.

Accuracy.—Results good.

Discharge measurements of Baker River below Anderson Creek, near Concrete, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 23	H. P. Gilkey	3.15	1,210	Feb. 16	H. P. Gilkey	2.86	491
Nov. 6	do	4.77	2,850	Mar. 10	do	3.31	734
Dec. 9	do	5.00	2,490	May 22	do	5.35	2,690
26	do	4.55	1,920	June 14	do	6.59	5,320
				July 1	do	5.34	2,900
1911.				Sept. 8	W. W. Clifford	4.40	1,740
Feb. 10	H. P. Gilkey	2.88	510				

Daily gage height, in feet, of Baker River below Anderson Creek, near Concrete, Wash., for the year ending Sept. 30, 1911.

[G. C. Burch, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	4.6	3.2			3.0	2.6	4.1	5.2	6.1		4.9	4.8
2	4.3	3.9			2.9	2.7	4.0	5.4	6.4	5.8	5.0	4.9
3	6.0	3.7		3.6	2.9	2.7	3.9	5.6	5.6	5.6	5.0	4.8
4	4.7	3.4		3.8	2.9	2.7	4.1	6.5		5.3	5.0	4.6
5	4.7	3.4		3.8	2.9	2.7	3.7	5.8	5.8	5.5	4.9	4.4
6	10.0	4.8		3.9	2.8	2.8	3.5	5.7	5.7		5.2	4.5
7	5.3	6.4		4.2	2.9	3.1	3.8	5.0	5.0	6.0	5.2	4.8
8	5.7	5.2		4.0		3.3	3.3	5.0	5.1	5.6		4.4
9	5.4	4.5	4.8	4.1	2.9	3.3	3.7	4.7		5.4	4.9	4.2
10	4.7	7.5	4.4	3.9	2.9	3.3	3.9		6.5		4.7	4.3
11	4.3	5.7	4.1	3.8	3.0	3.2	3.8		7.0		4.5	4.3
12	3.8	5.0	3.9	3.6	3.0	3.2	3.7		7.3		4.5	4.4
13	4.0		3.8	3.6	3.0	3.1	3.5	4.4	7.2	6.3	4.4	
14	3.8	3.8	3.8	3.4	2.9	3.1	3.5	4.4	7.0	6.4	4.4	5.5
15	3.5	3.6	3.9	3.4	2.9	3.1	3.5	4.7	6.8	6.4	4.4	
16	4.0	3.3	3.9	3.4		3.3	3.7		6.5	6.5	4.2	5.9
17	5.7	3.2	3.9	3.4	2.9	3.5	3.6	5.4		6.5	4.5	5.0
18	4.6	3.1	3.8	3.6		3.6	3.6	5.4	5.8		4.7	4.4
19	3.3	3.2	3.9	3.4	2.8	3.6	3.7		5.6	6.2	4.4	4.2
20	3.6		3.9	3.4	2.9		3.7	5.5	5.4	5.9	4.6	4.3
21			3.8	3.4	2.7	4.1	4.0	5.2	5.4	5.5	4.5	4.9
22	3.2		4.2	3.3	2.7	4.2	4.2	5.4	5.2	5.1		4.5
23	3.15		4.5	3.3	2.7	4.2	4.2		5.0	5.5		4.5
24	5.6		4.5	3.2	2.7	4.8	5.2		4.9	5.9	4.4	4.4
25	7.7		4.6	3.2	2.7	4.4	5.4		5.5	6.0	4.7	4.0
26	4.0		4.6	3.2	2.7	4.2	4.9		7.0	5.4		4.0
27	3.2			3.2	2.6	3.9	4.6		6.5	5.2	4.6	4.0
28	3.1			3.1	2.7	3.6	4.5		5.8	5.4	4.5	4.0
29	3.4			3.0		3.7	4.5	5.6	5.4	5.4	4.6	3.6
30	3.1			3.0		3.7	4.8	6.3	5.6	5.2	4.7	3.5
31	3.1					4.2		6.5		4.9	4.8	

NOTE.—Gage heights Sept. 10 to Oct. 20, 1910, have been reduced to datum of present gage by means of a relation curve. Gage heights Oct. 22 to Nov. 19, 1910, reduced to datum of present gage by adding 4.1 feet.

Daily discharge, in second-feet, of Baker River below Anderson Creek, near Concrete, Wash., for Sept. 10, 1910, to Sept. 30, 1911.

Day.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July	Aug.	Sept.
1		2,650	1,250		966	572	410	1,410	2,770	3,940	3,560	2,340	2,210
2		2,280	1,860		966	524	444	1,310	3,070	4,520	3,740	2,480	2,340
3		5,030	1,670		966	524	444	1,220	3,390	3,060	3,390	2,480	2,210
4		2,780	1,410		1,130	524	444	1,410	5,130	3,220	2,920	2,480	1,960
5		2,780	1,410		1,130	524	444	1,050	3,390	3,390	3,230	2,340	1,720
6		10,600	2,910		1,220	482	482	890	3,220	3,220	3,670	2,770	1,840
7		3,700	5,930		1,510	524	626	750	2,210	2,210	4,110	2,770	2,210
8		4,430	3,520		1,310	524	750	750	2,210	2,340	3,390	2,560	1,720
9		3,870	2,520	2,240	1,410	524	750	1,050	1,840	3,530	3,070	2,340	1,510
10	1,180	2,780	8,820	1,730	1,220	524	750	1,220	1,760	4,720	3,480	2,080	1,610
11	1,180	2,280	4,430	1,390	1,130	572	686	1,130	1,670	5,800	3,890	1,840	1,610
12	1,180	1,760	3,200	1,180	966	572	686	1,050	1,580	7,000	4,280	1,840	1,720
13	1,250	1,960		1,080	966	572	626	890	1,500	6,760	4,700	1,720	2,480
14	1,180	1,760	1,760	1,080	818	524	626	890	1,500	6,280	4,910	1,720	3,230
15	1,180	1,490	1,580	1,180	818	524	626	890	1,840	5,810	4,910	1,720	3,580
16	1,330	1,960	1,330	1,180	818	524	750	1,050	2,200	5,130	5,130	1,510	3,920
17	1,410	4,430	1,250	1,180	818	524	890	966	2,760	4,440	5,130	1,840	2,480
18	1,490	2,650	1,180	1,080	966	503	966	966	2,760	3,740	4,820	2,080	1,720
19	1,760	1,330	1,250	1,180	818	482	966	1,050	2,840	3,390	4,500	1,720	1,510
20	1,960	1,580		1,180	818	524	1,190	1,050	2,910	3,070	3,920	1,960	1,610
21	1,960			1,080	818	444	1,410	1,310	2,480	3,070	3,230	1,840	2,340
22	1,760	1,250		1,500	750	444	1,510	1,510	2,760	2,770	2,620	1,800	1,840
23	1,490	1,220		1,850	750	444	1,510	1,510	3,000	2,480	3,230	1,760	1,840
24	1,330	4,240		1,850	686	444	2,210	2,770	2,400	2,340	3,920	1,720	1,720
25	1,250	9,380		1,980	686	444	1,720	3,070	2,300	3,230	4,110	2,080	1,310
26	1,250	1,960		1,980	686	444	1,510	2,340	2,300	6,280	3,070	2,020	1,310
27	1,250	1,250			686	410	1,220	1,960	2,300	5,130	2,770	1,960	1,310
28	1,330	1,180			626	444	966	1,840	2,400	3,740	3,070	1,840	1,310
29	1,670	1,410			572		1,050	1,840	3,060	3,070	3,070	1,960	966
30	1,330	1,180			572		1,050	2,210	4,320	3,390	2,770	2,080	890
31		1,180			572		1,510		4,720		2,340	2,210	

NOTE.—Discharge determined from three fairly well-defined rating curves. No attempt has been made to estimate monthly discharge for September to December, 1910. Discharge May 23 to 28, 1911, estimated by comparison with records on Baker River at Concrete. Discharge interpolated for all other days when no gage height was reported.

Monthly discharge of Baker River near Concrete, Wash., for the year ending Sept. 30, 1911.

[Drainage area, 184 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	1,510	572	909	4.94	5.70	55,900	A.
February	572	410	503	2.73	2.84	27,900	A.
March	2,210	410	943	5.12	5.90	58,000	A.
April	3,070	750	1,380	7.50	8.37	82,100	A.
May	5,130	1,500	2,660	14.5	16.72	164,000	B.
June	7,000	2,210	4,040	22.0	24.55	240,000	B.
July	5,130	2,340	3,710	20.2	23.29	228,000	A.
August	2,770	1,510	2,060	11.2	12.91	127,000	A.
September	3,920	890	1,930	10.5	11.71	115,000	A.
The period						1,100,000	

BAKER RIVER AT CONCRETE, WASH.

Location.—In sec. 11, T. 35 N., R. 8 E., at the highway bridge in Concrete, about one-fourth mile above the mouth.

Records available.—September 11, 1910, to September 30, 1911.

Drainage area.—270 square miles.[1]

Gage.—Staff in two sections; the lower section inclined, the upper vertical.

Channel.—Gravel; shifting in floods.

Discharge measurements.—Made from the bridge 50 feet above the gage.

Accuracy.—Results good.

Discharge measurements of Baker River at Concrete, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Oct. 3	Kimble and Gilkey	7.98	9,380	Feb. 9	H. P. Gilkey	2.58	758
Nov. 7	H. P. Gilkey	7.87	12,000	17	do	2.52	691
Dec. 7	do	4.98	4,040	Mar. 11	do	2.96	1,040
7	do	4.89	3,940	Apr. 19	do	3.30	1,380
24	do	4.94	3,930	May 23	do	4.39	2,850
				June 14	do	6.00	6,700
1911.				July 1	do	4.55	3,580
Jan. 10	Robert Howes	3.91	2,080	Sept. 9	W. W. Clifford	[a] 3.5	1,800
Feb. 7	do	2.58	751				

[a] Observer's gage reading for the day.

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[1] Revised value based on recent measurements.

Daily gage height, in feet, of Baker River at Concrete, Wash., for the year ending Sept. 30, 1911.

[Charles Olsen, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	5.8	4.1	3.9	3.6	2.7	2.4	3.6	4.3	6.0	4.6	4.2	4.0
2	5.3	4.4	4.9	3.4	2.6	2.4	3.6	4.6	6.4	4.9	4.1	4.0
3	7.75	4.3	4.6	3.4	2.6	2.4	3.5	4.9	5.1	4.8	4.0	3.8
4	6.0	4.1	4.4	3.5	2.6	2.4	3.3	5.4	4.6	4.8	4.0	3.7
5	5.7	4.0	4.7	3.6	2.6	2.4	3.2	5.5	4.1	4.7	4.1	3.5
6	8.65	5.3	4.9	3.8	2.6	2.5	3.2	5.1	4.1	4.7	4.1	3.8
7	6.75	7.65	4.9	4.5	2.6	2.7	3.0	4.5	4.2	4.8	4.0	3.7
8	6.2	6.0	4.85	4.1	2.6	3.0	3.0	4.4	4.5	4.8	3.9	3.7
9	6.2	5.1	4.55	4.2	2.6	3.0	3.3	4.3	4.8	4.5	3.8	3.5
10	5.4	9.05	4.2	3.9	2.6	3.0	3.6	4.1	5.2	4.2	3.8	3.4
11	4.8	6.8	4.0	3.8	2.8	3.0	3.4	4.0	4.9	4.2	3.9	3.4
12	4.2	5.2	3.85	3.5	2.7	2.9	3.2	4.0	6.1	4.5	3.8	3.5
13	4.3	4.6	3.75	3.4	2.6	2.8	3.2	4.0	6.2	4.8	3.6	4.9
14	4.2	4.3	3.6	3.2	2.6	2.8	3.1	3.9	6.0	5.1	3.5	4.5
15	4.4	4.0	3.55	3.2	2.6	2.8	3.0	4.2	5.8	5.2	3.5	5.8
16	4.3	3.8	3.8	3.2	2.6	3.0	3.1	4.9	5.5	5.4	3.5	5.1
17	4.35	3.7	3.6	3.2	2.6	3.1	3.1	4.7	5.0	5.4	3.6	4.9
18	5.3	3.8	3.5	3.2	2.6	3.2	3.4	4.7	4.7	5.2	3.6	4.8
19	4.7	3.8	3.5	3.2	2.6	3.3	3.4	4.8	4.5	5.0	3.5	4.5
20	4.4	7.0	3.65	3.2	2.5	3.5	3.3	4.4	4.4	4.8	4.2	4.9
21	4.2	9.65	3.6	3.1	2.5	3.7	3.5	4.4	4.6	4.6	3.8	4.5
22	4.0	6.2	3.5	3.0	2.5	3.8	3.6	4.7	4.5	4.2	3.7	3.9
23	4.0	5.6	5.2	3.0	2.5	4.2	3.8	4.4	4.4	4.2	3.6	3.8
24	5.9	4.9	4.9	3.0	2.5	4.3	4.2	4.2	4.4	4.5	3.5	3.5
25	7.8	4.5	4.7	2.9	2.5	4.1	4.7	4.2	4.4	4.8	3.5	3.4
26	5.4	4.2	4.4	2.9	2.4	3.8	4.2	4.3	5.5	4.6	3.5	3.3
27	4.6	4.0	4.1	2.8	2.4	3.6	4.0	4.2	5.6	4.3	3.6	3.1
28	4.3	3.8	3.9	2.8	2.4	3.4	3.9	4.4	5.0	4.3	3.6	3.0
29	4.1	3.7	3.8	2.8	......	3.3	3.9	4.7	4.7	4.3	3.7	3.0
30	4.0	4.1	4.0	2.7	......	3.4	4.0	5.1	4.5	4.3	3.8	2.9
31	3.8	......	3.8	2.7	......	3.5	......	5.6	......	4.2	4.0	......

Daily discharge, in second-feet, of Baker River at Concrete, Wash., for Sept. 11, 1910, to Sept. 30, 1911.

Day.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	......	4,200	2,380	2,080	1,680	820	640	1,680	2,710	6,310	3,610	2,850	2,500
2	......	3,270	2,890	3,880	1,450	750	640	1,680	3,270	7,690	4,230	2,670	2,500
3	......	8,740	2,710	3,270	1,450	750	640	1,560	3,880	4,650	4,020	2,500	2,190
4	......	6,310	2,380	2,890	1,560	750	640	1,340	4,940	3,610	4,020	2,500	2,050
5	......	5,610	2,230	3,470	1,680	750	640	1,240	5,160	2,670	3,810	2,670	1,780
6	......	13,800	4,720	3,880	1,940	750	690	1,240	4,300	2,670	3,810	2,670	2,190
7	......	8,200	10,700	3,880	3,080	750	820	1,060	3,080	2,850	4,020	2,500	2,050
8	......	6,800	6,310	3,780	2,380	750	1,060	1,060	2,890	3,410	4,020	2,340	2,050
9	......	6,800	4,300	3,180	2,540	750	1,060	1,340	2,710	4,020	3,410	2,190	1,780
10	......	4,940	15,200	2,540	2,080	750	1,060	1,680	2,380	4,870	2,850	2,190	1,660
11	865	3,670	8,330	2,230	1,940	895	1,060	1,450	2,230	4,230	2,850	2,340	1,660
12	865	2,540	4,510	2,010	1,560	820	975	1,240	2,230	6,940	3,410	2,190	1,780
13	900	2,710	3,270	1,880	1,450	750	895	1,240	2,230	7,180	4,020	1,910	4,230
14	940	2,540	2,710	1,680	1,240	750	895	1,150	2,080	6,700	4,650	1,780	3,410
15	1,060	2,890	2,230	1,620	1,240	750	895	1,060	2,540	6,240	4,870	1,780	6,240
16	1,150	2,710	1,940	1,940	1,240	750	1,060	1,150	3,880	5,550	5,320	1,780	4,650
17	1,360	2,800	1,810	1,680	1,240	750	1,150	1,150	3,470	4,440	5,320	1,910	4,230
18	1,250	4,720	1,940	1,560	1,240	750	1,240	1,450	3,470	3,810	4,870	1,910	4,020
19	1,470	3,470	1,940	1,560	1,240	750	1,340	1,450	3,670	3,410	4,440	1,780	3,410
20	1,830	2,890	8,870	1,740	1,240	690	1,560	1,340	2,890	3,220	4,020	2,850	4,230
21	1,830	2,540	17,400	1,680	1,150	690	1,810	1,560	2,890	3,610	3,610	2,190	3,410
22	1,830	2,230	6,800	1,560	1,060	690	1,940	1,680	3,470	3,410	2,850	2,050	2,340
23	1,580	2,230	5,380	4,510	1,060	690	2,540	1,940	2,890	3,220	2,850	1,910	2,190
24	1,250	6,070	3,880	3,880	1,060	690	2,710	2,540	2,540	3,220	3,410	1,780	1,780
25	1,150	11,100	3,080	3,470	975	690	2,380	3,470	2,540	3,220	4,020	1,780	1,660
26	1,060	4,940	2,540	2,890	975	640	1,940	2,540	2,710	5,550	3,610	1,780	1,540
27	980	3,270	2,230	2,380	895	640	1,680	2,230	2,540	5,780	3,030	1,910	1,330
28	1,060	2,710	1,940	2,080	895	640	1,450	2,080	2,890	4,440	3,030	1,910	1,230
29	2,250	2,380	1,810	1,940	895	......	1,340	2,080	3,470	3,810	3,030	2,050	1,230
30	1,360	2,230	2,380	2,230	820	......	1,450	2,230	4,300	3,410	3,030	2,190	1,140
31	......	1,940	......	1,940	820	......	1,560	......	5,380	......	2,850	2,500	......

NOTE.—Discharge determined from three fairly well defined rating curves.

Monthly discharge of Baker River at Concrete, Wash., for 1910–11.

[Drainage area, 270 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
1910.							
September 11-30	2,250	865	1,300	4.81	3.58	51,600	B.
1910-11.							
October	13,800	1,940	4,560	16.9	19.48	280,000	B.
November	17,400	1,810	4,630	17.1	19.08	276,000	A.
December	4,510	1,560	2,560	9.48	10.93	157,000	A.
January	3,080	820	1,420	5.26	6.06	87,300	A.
February	895	640	736	2.73	2.84	40,900	A.
March	2,710	640	1,280	4.74	5.46	78,700	A.
April	3,470	1,060	1,630	6.04	6.74	97,000	A.
May	5,380	2,080	3,210	11.9	13.72	197,000	A.
June	7,690	2,670	4,470	16.6	18.52	266,000	A.
July	5,320	2,850	3,770	14.0	16.14	232,000	A.
August	2,850	1,780	2,170	8.04	9.27	133,000	A.
September	6,240	1,140	2,550	9.44	10.53	152,000	A.
The year	17,400	640	2,760	10.2	138.77	2,000,000	

WHATCOM CREEK BASIN.

WHATCOM CREEK AT BELLINGHAM, WASH.

Location.—In sec. 28, T. 38 N., R. 3 E., at the Northern Pacific Railway siding bridge opposite Larson's station on the Bellingham Electric Railway, one-eighth mile below Lake Whatcom, within the limits of the city of Bellingham, and about 3½ miles above the mouth.

Records available.—November 1, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel.—Gravel and sand; practically permanent.

Discharge measurements.—Made from a gaging bridge on the upstream side of the railroad bridge.

Regulation.—The level of the lake is controlled by a dam at the outlet.

Diversions.—The city of Bellingham gets its water supply from the lake. The amount of this diversion has not been determined.

Accuracy.—Results good.

Cooperation.—Gage-height record furnished by the city of Bellingham.

Discharge measurements of Whatcom Creek at Bellingham, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Nov. 1	H. P. Gilkey	3.56	92.9	Feb. 11	H. P. Gilkey	4.06	193
Dec. 2	.....do	4.68	375	11	.....do	4.02	191
2	.....do	4.67	375	May 19	.....do	2.57	21
18	.....do	4.58	327	19	.....do	3.79	137
20	.....do	4.5	306	June 27	W. W. Clifford	3.13	56.6

Daily gage height, in feet, of Whatcom Creek at Bellingham, Wash., for the year ending Sept. 30, 1911.

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	3.6	4.7	4.95	4.35	3.90	....	2.48	2.39	2.41	2.56	2.56
2	3.55	4.65	4.85	4.30	3.85	3.80	2.43	2.65	2.42	2.47	2.56
3	3.6	4.65	4.80	4.25	3.80	3.75	2.47	2.37	2.51	2.86	2.53
4	3.6	4.6	4.80	4.20	3.80	3.45	2.42	2.56	2.51	2.74	2.51
5	3.8	4.6	4.80	4.20	3.80	3.35	2.42	2.56	2.49	2.55	2.44
6	3.95	4.7	4.80	4.15	3.75	3.35	2.42	2.56	2.49	2.51	2.48
7	4.15	4.8	4.85	4.10	3.80	3.30	2.10	2.60	2.51	2.50	2.48
8	4.2	4.95	4.85	4.05	3.90	3.30	2.70	2.60	2.51	2.42	2.51
9	4.3	5.0	4.95	4.00	3.95	3.30	2.20	2.60	2.45	2.50	2.36
10	4.45	5.0	5.00	4.00	4.00	3.40	2.25	2.42	2.47	2.50	2.36
11	4.5	4.95	4.95	4.05	4.00	3.40	2.30	....	2.45	2.62	2.48
12	....	4.9	4.90	4.05	4.00	3.40	2.50	2.51	2.45	2.43	2.48
13	4.2	4.85	4.90	4.10	4.00	3.40	2.81	2.55	2.52	2.80	2.58
14	4.9	4.85	4.85	4.10	4.00	3.40	2.95	2.54	2.56	2.62	2.58
15	4.85	4.7	4.80	4.10	3.95	3.25	2.81	2.55	2.56	2.68	2.48
16	4.6	4.7	4.75	4.10	3.95	2.70	2.80	2.47	2.56	2.68	2.49
17	4.55	4.6	4.70	4.10	3.90	2.70	2.95	2.49	2.60	2.93	2.65
18	4.5	4.65	4.70	4.10	3.90	2.80	2.88	2.28	2.56	2.79	2.49
19	4.55	4.55	4.70	4.10	3.90	2.80	2.88	2.49	2.54	2.68	2.54
20	4.7	4.5	4.80	4.05	3.90	2.85	2.74	2.54	2.54	2.57	2.49
21	5.0	4.45	4.80	4.05	3.90	2.88	3.08	2.49	2.58	2.52	2.90
22	5.2	4.4	4.80	4.05	3.85	2.90	2.86	2.56	2.52	2.85	2.90
23	5.25	4.5	4.75	4.05	3.85	2.90	2.92	2.56	2.68	2.39	2.90
24	5.25	4.8	4.70	4.05	3.80	2.90	2.64	2.56	2.56	2.52	2.90
25	5.2	4.85	4.70	4.00	3.95	2.95	2.37	2.48	2.56	2.52	2.88
26	5.1	4.9	4.60	3.95	....	2.95	2.43	2.54	2.56	2.85	2.88
27	5.0	5.0	4.50	3.90	....	2.52	2.90	2.49	2.56	2.83	2.88
28	4.9	5.0	4.50	3.90	....	2.52	2.90	2.49	2.56	2.74	2.88
29	4.85	5.0	4.45	....	....	2.52	2.12	2.47	2.51	2.53	2.85
30	4.7	5.1	4.40	....	....	2.52	2.34	2.47	2.56	2.52	2.85
31	....	5.0	4.40	....	....	....	2.63	....	2.74	2.52	....

Daily discharge, in second-feet, of Whatcom Creek at Bellingham, Wash., for the year ending Sept. 30, 1911.

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	107	376	472	266	161	145	17	13	14	21	21
2	100	359	432	252	151	141	14	26	14	16	21
3	107	359	412	240	141	132	16	12	18	38	20
4	107	342	412	227	141	87	14	21	18	30	18
5	141	342	412	227	141	76	14	21	18	20	15
6	172	376	412	216	132	76	14	21	18	18	17
7	216	412	432	204	141	70	2	23	18	18	17
8	227	472	432	193	161	70	28	23	18	14	18
9	252	493	472	182	172	70	5	23	16	18	11
10	295	493	493	182	182	81	7	14	16	18	11
11	310	472	472	193	182	81	9	16	16	24	17
12	268	451	451	193	182	81	18	18	16	14	17
13	227	432	451	204	182	81	35	20	19	34	22
14	451	432	432	204	182	81	43	20	21	24	22
15	432	376	412	204	172	66	35	20	21	27	17
16	342	376	394	204	172	28	34	16	21	27	18
17	326	342	376	204	161	28	43	18	23	42	26
18	310	359	376	204	161	34	39	8	21	33	18
19	326	326	376	204	161	34	39	18	20	27	20
20	376	310	412	193	161	37	30	20	20	22	18
21	493	295	412	193	161	39	52	18	22	19	40
22	583	280	412	193	151	40	38	21	19	37	40
23	608	310	394	193	151	40	41	21	27	13	40
24	608	412	376	193	141	40	25	21	21	19	40
25	583	432	376	182	172	43	12	17	21	19	39
26	537	451	342	172	168	43	14	20	21	37	39
27	493	493	310	161	164	19	40	18	21	36	39
28	451	493	310	161	160	19	40	18	21	30	39
29	432	493	295	....	156	19	3	16	18	20	37
30	376	537	280	....	153	19	11	16	21	19	37
31	....	493	280	....	149	....	24	....	30	19	....

NOTE.—Discharge determined from a rating curve well defined below 500 second-feet.

Monthly discharge of Whatcom Creek at Bellingham, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
November	608	100	342	20,400	A.
December	537	280	406	25,000	A.
January	493	280	397	24,400	A.
Februray	266	161	202	11,200	A.
March	182	132	160	9,840	A.
April	145	19	60.7	3,610	A.
May	52	2	24.4	1,500	B.
June	26	8	18.6	1,110	B.
July	30	14	19.6	1,210	B.
August	42	13	24.3	1,490	B.
September	40	11	25.1	1,490	B.
The period				101,000	

NOOKSAK RIVER BASIN.

NORTH FORK OF NOOKSAK RIVER NEAR GLACIER, WASH.

Location.—In sec. 2, T. 39 N., R. 6 E., at the Bellingham Bay & British Columbia Railroad bridge, 1,000 feet below Canyon Creek, 2 miles above Boulder Creek, and 3 miles below Glacier Creek and Glacier.

Records available.—September 7, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Inclined staff.

Channel.—Coarse gravel; shifting in floods.

Discharge measurements.—Made from the railroad bridge.

Accuracy.—Results good.

Discharge measurements of North Fork of Nooksak River near Glacier, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*	1911.		*Feet.*	*Sec.-ft.*
Nov. 2	H. P. Gilkey	2.75	1,260	Feb. 13	H. P. Gilkey	1.40	317
Dec. 3	.....do	3.08	1,530	May 18	.....do	3.54	1,560
19	.....do	2.26	663	June 28	.....do	4.60	2,680
				Sept. 16	W. W. Clifford	4.22	2,220
1911.							
Feb. 13	H. P. Gilkey	1.40	315				

Daily gage height, in feet, of North Fork of Nooksak River near Glacier, Wash., for the year ending Sept. 30, 1911.

[Herman Steiner, observer.]

Day.	Oct.	Nov.	Dec.	May.	June.	July.	Aug.	Sept.
1	2.9				5.0	4.0	3.6	3.6
2					4.7	4.2	3.7	3.7
3		2.75	3.1		4.1	4.1	3.7	3.8
4					3.7	3.9	3.8	3.3
5	3.0				3.4	4.7	3.6	3.3
6					3.3	5.1	3.6	3.2
7					3.3	4.5	3.5	3.4
8					3.5	4.2	3.5	3.3
9					3.8	3.9	3.4	3.1
10					4.4	3.8	3.3	3.1
11					5.5	3.7	3.5	3.2
12	2.7				5.5	4.5	3.3	3.3
13					5.6	4.6	3.3	5.1
14	2.7				5.3	4.9	3.2	4.3
15		2.5			5.2	5.4	3.0	4.9
16					4.9	5.1	3.0	4.0
17					4.5	5.0	3.3	3.5
18		2.5		3.5	4.2	4.8	3.4	3.2
19	2.9		2.25	3.3	4.0	4.5	3.3	3.0
20				3.2	3.8	4.4	3.4	3.0
21		5.8		3.4	4.0	4.1	3.2	3.2
22				3.5	4.0	3.9	3.1	3.0
23				3.2	3.8	4.0	2.9	2.9
24				3.1	3.7	4.4	3.2	2.7
25	4.8			3.2	3.7	4.5	3.3	2.6
26		2.3		3.1	4.6	4.0	3.4	2.5
27				3.2	5.1	3.9	3.1	2.5
28	2.5			3.3	4.5	3.8	3.2	2.4
29				3.7	4.0	3.9	3.4	2.5
30				4.1	3.9	3.8	4.0	2.6
31				4.8		3.7	3.8	

Daily discharge, in second-feet, of North Fork of Nooksak River near Glacier, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	May.	June.	July.	Aug.	Sept.
1	1,370				3,150	2,010	1,620	1,620
2		1,250			2,790	2,220	1,710	1,710
3			1,260		2,110	2,110	1,710	1,810
4					1,710	1,910	1,810	1,350
5	1,450				1,440	2,790	1,620	1,350
6					1,350	3,280	1,620	1,270
7					1,350	2,550	1,530	1,440
8					1,530	2,220	1,530	1,350
9					1,810	1,910	1,440	1,190
10					2,440	1,810	1,350	1,190
11					3,800	1,710	1,530	1,270
12	1,210				3,800	2,550	1,350	1,350
13					3,940	2,670	1,350	3,280
14	1,210				3,540	3,030	1,270	2,330
15		1,050			3,410	3,670	1,120	3,030
16					3,030	3,280	1,120	2,010
17					2,550	3,150	1,350	1,530
18		1,050		1,530	2,220	2,910	1,440	1,270
19	1,370		670	1,350	2,010	2,550	1,350	1,120
20				1,270	1,810	2,440	1,440	1,120
21		4,040		1,440	2,010	2,110	1,270	1,270
22				1,530	2,010	1,910	1,190	1,120
23				1,270	1,810	2,010	1,050	1,050
24				1,190	1,710	2,440	1,270	920
25	3,080			1,270	1,710	2,550	1,350	860
26		910		1,190	2,670	2,010	1,440	800
27				1,270	3,280	1,910	1,190	800
28	1,050			1,350	2,550	1,810	1,270	740
29				1,710	2,010	1,910	1,440	800
30				2,110	1,910	1,810	2,010	860
31				2,910		1,710	1,810	

NOTE.—Discharge determined from a well defined rating curve. No attempt has been made to estimate monthly discharge for October to December, 1910.

Monthly discharge of North Fork of Nooksak River near Glacier, Wash., for the year ending Sept. 30, 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
May 18-31	2,910	1,190	1,530	42,500	A.
June	3,940	1,350	2,380	142,000	A.
July	3,670	1,710	2,350	144,000	A.
August	2,010	1,050	1,440	88,500	A.
September	3,280	740	1,390	82,700	A.
The period				500,000	

NOOKSAK RIVER NEAR DEMING, WASH.

Location.—In sec. 28, T. 39 N., R. 4 E., at Nugent's bridge, 4 miles below Deming.

Records available.—September 6, 1910, to March 31, 1911.

Drainage area.—Not measured.

Gage.—Inclined staff on left bank, 10 feet above the bridge. Prior to December 5, 1910, an inclined staff in sec. 36, T. 39 N., R. 4 E., at the ferry at Deming, 4 miles above the present gage.

Channel.—Shifting gravel.

Discharge measurements.—Made from a cable at the original section. Made from the bridge at the present gage.

Estimates withheld for additional data.

Discharge measurements of Nooksak River near Deming, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
1910.				1911.			
Oct. 10	Kimble and Gilkey	5.42	4,680	Feb. 14[a]	H. P. Gilkey	2.70	1,600
Nov. 3	H. P. Gilkey	4.73	3,540				
4	.....do	4.52	3,000				
Dec. 22[a]	.....do	4.36	2,800				

[a] Measurement and gage reading at Nugent's bridge.

Daily gage height, in feet, of Nooksak River near Deming, Wash., for the year ending Sept. 30, 1911.

[A. J. Berg, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1	5.4	4.2		4.4	2.8	2.4	16	4.8	3.6	4.85	4.0	2.5	4.0
2	4.8	4.6		4.0	2.7	2.5	17	7.4	3.4	4.8	4.2	2.4	4.1
3	7.9	4.7		4.1	2.7	2.5	18	5.6	3.4	4.6	4.2	2.5	4.1
4	5.8	4.5		4.8	2.7	2.5	19	5.2	3.2	4.55	4.4	2.4	4.3
5	5.4	4.6	6.0	4.9	2.6	2.5	20	4.9	5.8	4.6	4.0	2.3	4.4
6	6.5	6.0	6.55	4.8	2.4	2.6	21	5.0	8.6	4.45	4.0	2.2	4.5
7	5.6	7.7	6.35	5.7	2.2	3.2	22	4.7	3.9	4.3	3.6	2.2	4.5
8	6.8	5.5	6.2	5.5	2.2	4.2	23	4.2	3.4	6.35	3.5	2.1	4.8
9	6.0	5.0	5.75	5.3	2.2	4.0	24	9.2	3.2	6.7	3.4	2.1	5.1
10	5.2	9.2	5.6	4.8	2.4	4.0	25	6.4		5.7	3.5	2.1	4.7
11	4.8	6.2	5.5	4.6	2.7	3.8	26	5.8		5.3	3.3	2.1	4.7
12	4.7	4.6	5.05	4.6	2.7	3.6	27	4.7		5.1	3.1	2.1	4.5
13	4.6	4.0	4.85	4.5	2.7	3.7	28	4.4		5.85	3.1	2.2	4.4
14	4.6	3.8	4.7	4.4	2.8	3.8	29	4.2		4.75	3.0		4.0
15	4.8	3.6	4.6	4.0	2.6	3.8	30	4.0		4.7	2.8		3.8
							31	4.3		4.7	2.8		4.0

MIDDLE FORK OF NOOKSAK RIVER AT RANGER STATION NEAR DEMING, WASH.

Location.—In the SW. ¼ sec. 30, T. 38 N., R. 7 E., one-eighth mile above Deming ranger station and 19 miles above Deming.

Records available.—September 4 to December 16, 1910.

Drainage area.—Not measured.

Gage.—Inclined staff.

Channel.—Shifting gravel.

Discharge measurements.—Made by wading.

Estimates withheld for additional data.

The following discharge measurement was made by H. P. Gilkey:

October 11, 1910: Gage height, 2.30 feet; discharge, 212 second-feet.

Daily gage height, in feet, of Middle Fork of Nooksak River at ranger station near Deming, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1	2.6	2.2	3.9	16	2.55	3.3	3.4
2	3.3	2.5	4.0	17	3.9	3.3	....
3	3.2	2.1	3.9	18	2.6	3.3	....
4	2.8	1.9	4.2	19	2.4	3.8	....
5	2.55	2.7	3.9	20	2.3	5.3	....
6	4.8	2.4	3.9	21	2.25	4.6	....
7	2.8	3.9	3.85	22	1.9	4.0	....
8	3.2	2.7	3.8	23	1.8	4.0	....
9	2.8	2.3	3.7	24	4.2	3.7	....
10	2.4	4.7	3.55	25	2.8	3.6	....
11	2.2	3.9	3.5	26	2.3	3.55	....
12	2.2	3.7	3.5	27	2.1	3.5	....
13	2.0	3.5	3.5	28	2.1	3.5	....
14	2.0	3.1	3.45	29	1.95	3.5	....
15	2.65	2.8	3.45	30	1.8	3.8	....
				31	2.0	....	....

MIDDLE FORK OF NOOKSAK RIVER NEAR DEMING, WASH.

Location.—In sec. 13, T. 38 N., R. 5 E., three-fourths of a mile above Weahley Creek, at the county highway bridge at the mouth of the canyon, 3 miles above the North Fork and 8 miles above Deming.

Records available.—October 10, 1910, to March 14, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff in two sections.

Channel.—Shifting gravel.

Discharge measurements.—Made from the highway bridge at the gage.

Estimates withheld for additional data.

Discharge measurements of Middle Fork of Nooksak River near Deming, Wash., in the year ending Sept. 30, 1911.

Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*
Oct. 11	H. P. Gilkey	2.05	593
Nov. 4	.....do	2.13	381
Dec. 23	.....do	3.15	1,840
1911.			
Feb. 15	H. P. Gilkey	1.17	145

Daily gage height, in feet, of Middle Fork of Nooksak River near Deming, Wash., for the year ending Sept. 30, 1911.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1	......	......	2.0	......	1.1	......	16	2.0	1.65	1.85	1.5	1.1	......
2	......	......	2.45	1.5	1.1	1.1	17	3.0	1.6	1.7	1.8	1.0	......
3	......	......	2.15	1.8	1.1	......	18	2.2	1.65	......	1.6	1.2	......
4	......	......	......	2.2	1.1	1.1	19	1.95	1.8	1.6	1.6	1.2	......
5	......	2.0	2.55	2.0	1.2	......	20	1.85	......	1.6	1.6	1.2	......
6	......	......	2.6	2.0	1.2	1.2	21	1.8	3.65	1.6	1.5	1.1	......
7	......	3.75	2.35	2.1	1.2	1.4	22	1.8	2.6	1.65	......	1.1	......
8	......	2.25	2.45	......	1.2	......	23	......	2.7	3.45	1.5	1.1	......
9	......	2.35	2.05	2.0	1.2	1.6	24	6.4	2.25	2.3	1.4	1.1	......
10	......	3.5	1.85	......	1.3	......	25	3.75	2.05	......	1.4	1.1	......
11	2.0	2.45	1.8	......	1.3	1.4	26	......	1.9	1.85	1.4	......	......
12	1.95	2.2	1.7	......	......	......	27	......	1.7	1.9	1.3	......	......
13	1.85	......	1.7	......	1.4	......	28	......	1.55	1.85	1.3	1.1	......
14	1.9	1.9	1.6	......	1.2	1.3	29	......	......	1.7	......	......	......
15	1.95	1.8	1.6	......	1.2	......	30	......	......	1.8	1.2	......	......
							31	......	......	1.7	1.2	......	......

MISCELLANEOUS MEASUREMENTS.

The following miscellaneous discharge measurements have been made on streams in the north Pacific coast drainage basins during the year ending September 30, 1911.

Miscellaneous measurements in the Pacific coast drainage basins in Oregon for the year ending Sept. 30, 1911.

Rogue River basin.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
June 23, 1911	North Fork of Little Butte Creek.	Little Butte Creek....	Lakecreek, Oreg......	2.53	61.0
Aug. 1, 1911	.....do..................	.....do..................	.....do..................	2.46	59.2
Dec. 2, 1910	Little Applegate River.	Applegate River......	Near Buncom, Oreg...	(*a*)	55.4
June 20, 1911	.....do..................	.....do..................	.....do..................		83.0
Aug. 7, 1911	.....do..................	.....do..................	.....do..................	....	8.0

a Water surface 4.7 feet below staple in forked tree on right bank, 300 feet above bridge.

Umpqua River basin.

Nov. 10, 1910	North Fork of South Fork of Umpqua River.	South Fork of Umpqua River.	Sec. 7, T. 30 S., R. 1 W., one-half mile above mouth.	2.63	141
Aug. 10, 1911	.....do..................	.....do..................	.....do..................	1.70	34.8
Do.......	South Fork of South Fork of Umpqua River.	.....do..................	Near mouth..........	....	22.2
Nov. 4, 1910	South Fork of North Fork of Umpqua River.	Umpqua River........	Wolf Creek ranger station near Peel, Oreg.	1.88	11.0
Aug. 15, 1911	.....do..................	.....do..................	.....do..................	1.85	13.4

Miscellaneous measurements in Columbia River basin for the year ending Sept. 30, 1911.

Kootenai River basin.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
Mar. 14, 1911	Lake Creek	Kootenai River	Railway bridge near Troy, Mont.		202
		Clark Fork basin.			
Sept. 29, 1911	Lost Horse Creek	Bitterroot River	Above mouth of South Fork near Como, Mont.		15.5
Do	South Fork of Lost Horse Creek.	Lost Horse Creek	Near Lost Horse Lake near Como, Mont.		1.5
Do	do	do	Near mouth		7.3
Sept. 7, 1911	Lolo Creek	Bitterroot River	Below Granite Creek near Lolo Hot Springs, Mont.		44.0
Oct. 18, 1910	do	do	Near Lolo, Mont	2.21	90.0
Apr. 21, 1911	Flathead River	Clark Fork	Polson, Mont	80.59	7,110
July 21, 1911	Middle Fork of Flathead River.	Flathead River	Near Java, Mont		67.0
Apr. 20, 1911	Spring Creek	Crow Creek	Ronan, Mont		17.2
June 13, 1911	do	do	do		16.3
Jan. 14, 1911	Mud Creek	do	Near Ronan, Mont	2.27	4.0
Mar. 25, 1911	do	do	do	2.33	5.0
Apr. 20, 1911	do	do	do		4.3
June 13, 1911	do	do	do		6.3
July 7, 1911	do	do	do		20.0
Aug. 3, 1911	do	do	do		10.5
June 13, 1911	Post Creek	Mission Creek	Lower bridge near St. Ignatius, Mont.		480
Oct. 4, 1910	North Fork of Post Creek.	Post Creek	Near Ronan, Mont		2.2
June 12, 1911	do	do	do		16.2
Aug. 1, 1911	Spring Creek	Mission Creek	Near St. Ignatius, Mont.		26.0
Oct. 6, 1910	do	Jocko River	Near Arlee, Mont		14.0
Jan. 10, 1911	do	do	do		13.2
Mar. 22, 1911	do	do	do		13.0
Apr. 29, 1911	do	do	do		11.1
June 14, 1911	do	do	do		12.4
July 2, 1911	do	do	do		12.7
Aug. 5, 1911	do	do	do		16.8
		Snake River basin.			
July 20, 1911	Idaho canal	Snake River (diverts from).	Bridge north of steel flume.		205
Sept. 10, 1911	Thousand Springs Creek.	Big Lost River	Elkhorn ranch		56.6
June 7, 1911	Little Lost River	Lost River sinks	Mouth of sawmill gulch above Clyde, Idaho.	2.88	296
Sept. 6, 1911	do	do	do	.90	28.8
Do	do	do	do		28.0
June 7, 1911	do	do	Above Hawley ranch headgates.	2.62	158
Sept. 6, 1911	Summit Creek	Little Lost River	8 miles above Clyde, Idaho.	1.11	10.8
Sept. 5, 1911	Wet Creek	do	Near Clyde, Idaho	1.11	24.0
Do	Dry Creek	do	do	2.10	29.8
Sept. 7, 1911	Badger Creek	do	8 miles below Clyde, Idaho.	.62	11.2
July 20, 1911	Blackfoot River	Snake River	At Fort Hall bridge		267
July 17, 1911	Corral Creek	Blackfoot River	1 mile above mouth		13.4
July 15, 1911	Indian Reservation ditch.	Diverts from Blackfoot River.	½ mile below headgates, 1½ miles below Shelley gaging station.		12.8
July 20, 1911	Little Butte canal	do	125 feet below headgates.		24.0
Do	Misner ditch	do	100 feet below headgates.		3.51
Do	Dunn's ditch	do	300 feet below headgates.		3.61

Miscellaneous measurements in Columbia River basin for the year ending Sept. 30, 1911—Continued.

Snake River basin—Continued.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
July 21, 1911	Eastern Idaho canal	Diverts from Blackfoot River.	50 feet above headgates		92.4
Do.	York Bros. and Just ditch.	do.	80 feet below headgates.		6.19
Do.	Burrell's ditch	do.	The headgates		75.4
Do.	do.	do.	Below last spillway		12.1
Do.	Just ditch	do.	Above spillway		74.6
Do.	do.	do.	Below spillway		7.78
July 17, 1911	Portneuf River	Snake River	Crossing on road from Rossfork to Indian Service dam.	3.17	2.96
July 18, 1911	North Fork of Rossfork Creek.	Rossfork Creek	Indian Service dam site.		10.3
Do.	do.	do.	John Kutche's ranch		10.8
July 11, 1911	Big Cottonwood Creek	Snake River	2 miles above Oakley gaging station.	1.25	3.23
Aug. 20, 1911	do.	do.	do.	.83	.73
Do.	do.	do.	do.	.83	.73
May 1, 1911	King Hill Irrigation Co. power canal.	Diverts from Big Wood River.	Gage No. 35	1.19	40.7
May 7, 1911	Buckaroo ditch	Diverts from Bruneau River.	Hot Spring post office		30.6
June 3, 1911	Grandview canal	do.	Near Comet post office.		86.6
July 18, 1911	Jordan Creek	Owyhee River	Highway bridge about 2 miles below Jordan Valley post office.	1.3	14.3
Feb. 4, 1911	Moore's Creek	Boise River	Highway bridge near mouth.	2.04	205
Mar. 16, 1911	do.	do.	do.	2.30	474
May 13, 1911	do.	do.	do.	2.55	757
May 26, 1911	do.	do.	do.	2.55	873
June 6, 1911	do.	do.	do.	2.45	929
July 14, 1911	do.	do.	do.	1.40	171
Aug. 21, 1911	do.	do.	do.	.56	26.2
July 4, 1911	North Fork of Malheur River.	Malheur River	Beulah, Oreg.		60.3
Aug. 31, 1911	Idaho-Oregon power canal.	Diverts from Payette River.	Horse Shoe Bend, Idaho.		756
May 6, 1911	Joslyn ditch	Diverts from Mann Creek.	Spangler's ranch	3.56	8.14
May 30, 1911	do.	do.	do.	2.70	2.58
July 9, 1911	do.	do.	do.	2.70	1.06
May 6, 1911	Mann Creek canal	do.	Heading		13.7
Do.	Lolley ditch	do.	do.		5.61
Do.	Adams ditch	do.	do.		2.09
Do.	Webb ditch	do.	do.		14.8
Do.	Hannah ditch	do.	do.		6.66
May 7, 1911	Lansdon ditch	do.	do.		[a]2.00
Do.	Shinkle ditch	do.	do.		1.74
Do.	Gilderoy ditch	do.	do.		4.93
Do.	Lund ditch	do.	do.		9.49
Do.	Bradshaw ditch	do.	do.		4.06
Do.	Parker ditch	do.	do.		3.08
Do.	Payne ditch	do.	do.		9.50
Do.	Ohm ditch	do.	do.		1.80
Do.	Barton ditch	do.	do.		2.81
July 9, 1911	Mann Creek canal	do.	do.		3.96
May 5, 1911	Eagle Creek	Powder River	In sec. 20, T. 8 S., R. 5 E.		985
July 31, 1911	do.	do.	do.		252
July 24, 1911	Sparta ditch	Diverts from West Fork of Eagle Creek.	3 miles below heading.		14.5
Aug. 22, 1911	Salmon River	Snake River	12 miles above Challis, Idaho.		1,170
Aug. 21, 1911	do.	do.	11 miles below Challis, Idaho.		1,240
Aug. 16, 1911	do.	do.	Salmon, Idaho		1,950
Sept. 9, 1911	Goldburg Creek	Pahsimeroi Creek	2 miles below Goldburg, Idaho.	1.35	4.39
Aug. 11, 1911	Lemhi River	Salmon River	Leadore, Idaho		32.0
Do.	Ditch on right bank	Diverts from Lemhi River.	do.		[a]3.00
Aug. 13, 1911	Lemhi River	Salmon River	Mouth of Eightmile Creek.		111
	do.	do.	Hayden station	1.35	120
Aug. 14, 1911	do.	do.	Above Kenny Creek		190
Aug. 17, 1911	do.	do.	8 miles above mouth		140

[a] Estimated.

Miscellaneous measurements in Columbia River basin for the year ending Sept. 30, 1911—Continued.

Snake River basin—Continued.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
Nov. 1, 1910	Timber Creek	Lemhi River	1 mile above Basin Creek near Leadore, Idaho.		17.3
Aug. 12, 1911	Hawley Creek	do	In the canyon		14.1
	do	do	At the dam site		[a]19.0
	Ditch on left bank	Diverts from Hawley Creek.	1 mile below dam site		[a]5.00
Aug. 13, 1911	Eightmile Creek	Lemhi River	Mouth		[a]2.80
	Little Eightmile Creek	do	do		[a]1.00
	Hayden Creek	do	do	1.00	61.4

Deschutes River basin.

Jan. 5, 1911	Flume of Bend Electric Light plant.	Diverts from Deschutes River.	Bend, Oreg.		[b]65.0
Jan. 8, 1911	Veazie Creek	Ochoco Creek	Near Prineville, Oreg.	0.48	[c].5
Mar. 7, 1911	do	do	do	1.00	6.2
Jan. 9, 1911	Lawson Creek	do	do	.54	1.1
Mar. 7, 1911	do	do	do	1.29	17.2
May 30, 1911	Jacks Creek	Metolius River	In sec. 28, T. 12 S., R. 9 E., 1 mile above mouth.	1.47	47.1
Do	Canyon Creek	do	do	2.04	79.5
June 1, 1911	Eagle Creek	do	Near mouth		9.1
Do	Cabot Creek	do	Trail crossing, 1 mile above mouth.		.129
Do	Jefferson Creek	do	do		126

Sandy River basin.

June 24, 1911	Zigzag River	Sandy River	NW. ¼ sec. 11, T. 3S, R. 7 E.	0.9	128
June 25, 1911	do	do	do	.9	121
July 17, 1911	do	do	do	.4	108
July 16, 1911	Salmon River	do	Sec. 13, T. 4 S., R. 8½ E.		49.5
July 17, 1911	do	do	Near mouth		158

Willamette River basin.

Oct. 6, 1910	Fall Creek	Middle Fork of Willamette River.	Near Fall Creek, Oreg.		97.0
July 27, 1911	do	do	do	1.09	48.3
Aug. 25, 1911	Frank Brice Creek	Row River	Near Disston, Oreg.		9.4
Oct. 10, 1910	Lost Creek	McKenzie River	Near McKinzie Bridge, Oreg.		201
Oct. 11, 1910	Horse Creek	do	do	1.75	319
Dec. 18, 1910	do	do	do	2.10	526
Mar. 9, 1911	do	do	do	2.00	425
May 5, 1911	do	do	do	2.35	686
July 19, 1911	do	do	do	2.00	354
Oct. 7, 1910	Otter Creek	North Fork of Santiam River.	Near Detroit, Oreg.		2.5
Do	Whiskey Creek	do	do		7.0
Oct. 8, 1910	Permelia Creek	do	do	4.50	80.9
June 22, 1911	do	do	Crossing of the Marion Lake trail.		109
Oct. 10, 1910	Tumble Creek	do	do		3.0
Oct. 8, 1910	Whitewater Creek	do	do	3.00	41.8
June 22, 1911	do	do	do		81.9
Jan. 15, 1911	French Creek	Breitenbush Creek	Mouth		18.0
Mar. 3, 1911	do	do	do		10.0
Apr. 19, 1911	do	do	do		40.0
June 20, 1911	do	do	do		27.0
Aug. 12, 1911	do	do	do		15.0

[a] Estimated.

[b] Measured at peak load on power plant.

[c] Estimated discharge.

Miscellaneous measurements in Columbia River basin for the year ending Sept. 30, 1911—Continued.

Willamette River basin—Continued.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
June 24, 1911	Salem power canal	Diverts from North Fork of Santiam River.	Stayton, Oreg.		101
July 7, 1911	Moose Creek	South Fork of Santiam River.	Cascadia, Oreg.		20.5
July 8, 1911	Canyon Creek	do	do		56.0
Oct. 13, 1910	Mill race	Diverts from Santiam River.	Jefferson, Oreg.		55.4
Sept. 25, 1911	South Fork of Molalla River.	Molalla River	In sec. 31, T. 5 S., R. 3 E., junction of forks.		136
	North Fork of Molalla River.	do	do		47.8
Mar. 3, 1911	Tualatin River	Willamette River	Mouth		1,430
Apr. 19, 1911	Clackamas River	do	do		3,620

Miscellaneous measurements in Puget Sound and Pacific Ocean drainage basins in Washington for the year ending Sept. 30, 1911.

Nisqually River basin.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
				Feet.	*Sec. ft.*
Nov. 26, 1910	Nisqually River		Elbe, Wash.		1,980

Duwamish River basin.

Aug. 23, 1901	Green River	Duwamish River	Kanaskat, Wash.		350
Sept. 1, 1901	do	do	do		238
Sept. 7, 1901	do	do	do		196
Oct. 8, 1901	do	do	do		179
Aug. 28, 1911	do	do	Hot Springs		41.1
Aug. 29, 1911	do	do	Eagle Gorge		81.1

Skykomish River basin.

Mar. 17, 1911	Sultan River	Skykomish River	Sultan, Wash.	—5.80	682
June 19, 1911	do	do	do	—5.92	691
July 22, 1911	do	do	do	—6.50	322
Sept. 30, 1911	do	do	do	—6.70	217

Nooksak River basin.

Dec. 21, 1910	Skookum Creek	South Fork of Nooksak River.	Deming, Wash.	2.70	86.0

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